

The University reserves the right to make changes as required in course offerings, curricula, academic policies and other rules and regulations affecting students, to be effective whenever determined by the University. These changes will govern current and formerly enrolled students. Enrollment of all students is subject to these conditions.

Fully accredited by the Southern Association of Colleges and Schools since 1922.

Bulletin of
Auburn University
A Land-Grant University

USPS 036-900



APRIL 1979
AUBURN, ALABAMA
CATALOG NUMBER 1979-80



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Board of Trustees

UNDER THE ORGANIC and statutory laws of Alabama, Auburn University is governed by a Board of Trustees consisting of one member from each congressional district, as these districts were constituted on January 1, 1961, an extra member from the congressional district in which the institution is located, and the Governor and State Superintendent of Education, who are members *ex officio*. The Governor is Chairman. Members of the Board of Trustees are appointed by the Governor by and with the advice and consent of the State Senate and hold office for terms of twelve years. Members of the board receive no compensation. Trustees serve until reappointed or their successors are named. By executive order of the Governor in 1971, a non-voting student representative, selected by the Student Senate, serves as a member *ex officio*.

The Board of Trustees places administrative authority and responsibility in the hands of an administrative officer at Auburn University. The institution is grouped for administrative purposes into divisions, schools, and departments.

MEMBERS EX OFFICIO

FOB JAMES, Governor of Alabama, <i>Chairman</i>	Montgomery
WAYNE TEAGUE, State Superintendent of Education	Montgomery
Student Body Representative, non-voting	Main Campus
Student Body Representative, non-voting Auburn University at Montgomery	

APPOINTED MEMBERS

TERMS ENDING IN 1983

R.C. BAMBERG, *Vice Chairman*, Uniontown, Sixth Congressional District
CHARLES M. SMITH, III, Montgomery, Second Congressional District
ROBERT H. HARRIS, Decatur, Eighth Congressional District

TERMS ENDING IN 1987

JOHN W. PACE, III, Mobile, First Congressional District
HENRY B. STEAGALL, II, Ozark, Third Congressional District
J. RALPH JORDAN, Auburn, Third Congressional District
FRANK P. SAMFORD, JR., Birmingham, Ninth Congressional District

TERMS ENDING IN 1991

BILL NICHOLS, Sylacauga, Fourth Congressional District
MICHAEL B. MCCARTNEY, Gadsden, Fifth Congressional District
MORRIS W. SAVAGE, Jasper, Seventh Congressional District

Administrative Council of the University

HARRY M. PHILPOTT, A.B., PH.D., D.D., LL.D., H.H.D.
President

BEN T. LANHAM, JR., B.S., M.S., PH.D.
Vice President for Administration

TAYLOR D. LITTLETON, B.S., M.A., PH.D.
Vice President for Academic Affairs

CHESTER C. CARROLL, B.S.E.E., M.S.E.E., PH.D.
Vice President for Research

GENE A. BRAMLETT, B.S., M.S., PH.D.
Vice President for Extension & Public Service

H. HANLY FUNDERBURK, B.S., M.S., PH.D.
Chancellor-Montgomery

H. FLOYD VALLERY, B.A., M.A., Ed.D.
Assistant to the President

W. HAROLD GRANT, B.S., Ed.D.
Special Assistant to the President

GEORGE L. BRADBERRY, B.S.
Director of Development

KATHARINE C. CATER, A.B., M.A., M.S., LITT.D.
Dean of Student Life

PAUL A. KEARNEY, B.S.
Director of Physical Plant

PAUL F. PARKS, B.S., M.S., PH.D.
Dean of Graduate School

T. DREW RAGAN, B.S., M.Ed., Ed.D.
Dean of Student Affairs

RHETT E. RILEY, B.S.
Business Manager and Treasurer

R. D. ROUSE, B.S., M.S., PH.D.
Director of Agricultural Experiment Station
Dean of School of Agriculture

J. MICHAEL SPROTT, B.S., M.S., PH.D.
Director of Cooperative Extension Service

WILBUR A. TINCHER, A.B., M.A., Ed.D.
Dean of Student Services

J. HERBERT WHITE, B.S.
Director of University Relations

UNIVERSITY CALENDAR 1979-80

JULY

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1979—Summer Quarter (47 class days) and Eight-Week Term (37 class days)

May 24, *Thurs.*.....Last day for completing applications for admission

June 13, *Wed.*...Orientation for new students

June 14, *Thurs.*.....Final Registration and Schedule Adjustment

June 15, *Fri.*.....Classes begin

July 4, *Wed.*.....Independence Day Holiday

July 16-20, *Mon.-Fri.*.....*Registration for Fall Quarter

July 20, *Fri.*.....Mid-quarter

Aug. 7, *Tues.*.....Classes end for term

Aug. 8-9, *Wed.-Thurs.*.....Final Exams for term

Aug. 21, *Tues.*.....Classes end for quarter

Aug. 22, *Wed.*.....Dead Day

Aug. 23, 24, 25, 27,

Thurs., Fri., Sat., Mon.,.....Final Exams

Aug. 28, *Tues.*.....Graduation, 2:30 p.m.

1979—Fall Quarter (48½ class days)

Sept. 4, *Tues.*.....Last day for completing applications for admission

Sept. 24, *Mon.*.....Orientation for new students

Sept. 25-26, *Tues.-Wed.*.....Final Registration and Schedule Adjustment

Sept. 27, *Thurs.*.....Classes begin

Oct. 16, *Tues.*.....General Faculty Meeting

Oct. 29-Nov. 8, *Mon.-Thurs.*.....*Registration for Winter Quarter

Oct. 31, *Wed.*.....Mid-quarter

Nov. 21-25, *Wed.-Noon-Sun.*.....Thanks-giving Holidays

Dec. 3-7, *Mon.-Fri.*.....Schedule Distribution and Fee Payment for Winter Quarter

Dec. 6, *Thurs.*.....Classes end

Dec. 7, *Fri.*.....Dead Day

Dec. 8, 10, 11, 12,

Sat., Mon., Tues., Wed.,.....Final Exams

Dec. 13, *Thurs.*.....Graduation, 2:30 p.m.

1980—Winter Quarter (47 class days)

Dec. 13, *Thurs.*.....Last day for completing applications for admission

Jan. 3-4, *Thurs.-Fri.*.....Final Registration and Schedule Distribution

Jan. 7, *Mon.*.....Classes begin

Jan. 29-Feb. 8, *Tues.-Fri.*.....*Registration for Spring Quarter

Feb. 8, *Fri.*.....Mid-quarter

Mar. 4-7, *Tues.-Fri.*.....Schedule Distribution and Fee Payment for Spring Quarter

UNIVERSITY CALENDAR—1980

Mar. 11, *Tues.*.....Classes end
 Mar. 12, *Wed.*.....Dead Day
 Mar. 13-15, 17, *Thurs. Fri., Sat., Mon.*.....Final Exams
 Mar. 18, *Tues.*.....Graduation, 2:30 p.m.

1980—Spring Quarter (47 class days)

Mar. 4, *Tues.*.....Last day for completing applications for admission
 Mar. 25-26, *Tues.-Wed.*.....Final Registration and Schedule Adjustment
 Mar. 27, *Thurs.*.....Classes begin
 Apr. 15, *Tues.*.....General Faculty Meeting
 Apr. 21-May 1, *Mon.-Thurs.*.....*Registration for Summer or Fall Quarter
 Apr. 30, *Wed.*.....Mid-quarter
 May 27-29, *Tues.-Thurs.*.....Schedule Distribution and Fee Payment for Summer Quarter
 May 30, *Fri.*.....Classes end
 June 2-5, *Mon., Tues., Wed., Thurs.*.....Final Exams
 June 6, *Fri.*.....Graduation, 2:30 p.m.

**1980—Summer Quarter (47 class days) and Eight-Week Term (37 class days)

May 23, *Fri.*.....Last day for completing applications for admission
 June 12, *Thurs.*.....Orientation for new students
 June 13, *Fri.*.....Final Registration and Schedule Adjustment
 June 16, *Mon.*.....Classes begin
 July 4, *Fri.*.....Independence Day Holiday
 July 14-18, *Mon.-Fri.*.....*Registration for Fall Quarter
 July 21, *Mon.*.....Mid-quarter
 Aug. 6, *Wed.*.....Classes end for term
 Aug. 7-8, *Thurs.-Fri.*.....Final Exams for term
 Aug. 20 *Wed.*.....Classes end for quarter
 Aug. 21, 22, 23, 25, *Thurs., Fri., Sat., Mon.*.....Final Exams
 Aug. 26, *Tues.*.....Graduation, 2:30 p.m.

NOTE: Schedule distribution and fee payment for Fall Quarter will be accomplished by mail prior to the opening of the quarter.

*The individual schools will publish the days of registration that will be utilized during the nine-day University registration period.

**All dates in the Summer Quarter are tentative and are subject to final approval prior to 1980-81 catalog printing.

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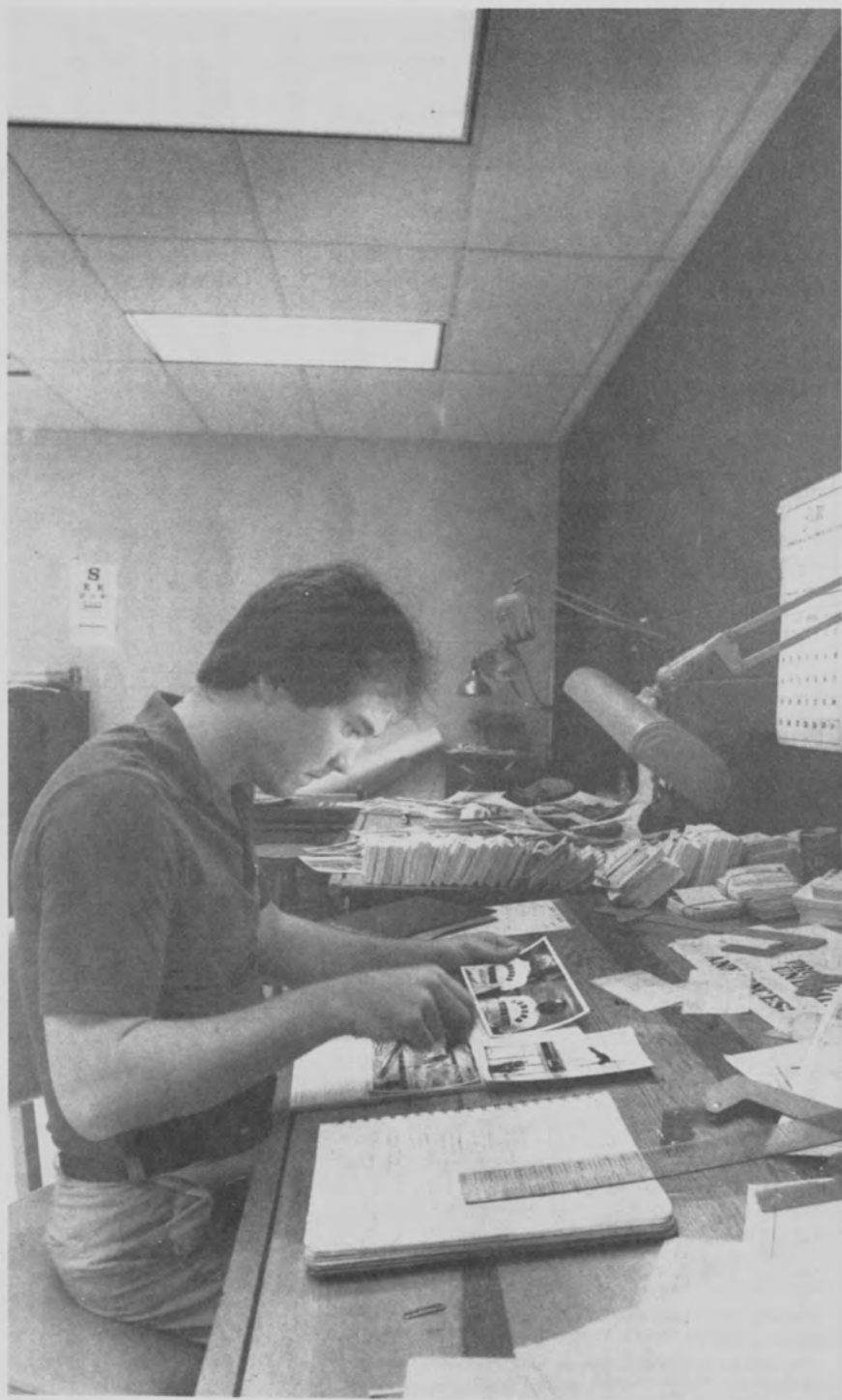
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The University

AUBURN UNIVERSITY, chartered in 1856, is located in Auburn, Alabama, on Interstate 85 in the eastern section of the state. Surrounded by farms and woodlands, the University enjoys the advantages of the security, seclusion, and clear air afforded by a small residential city. The 1,871-acre campus, with 71 major buildings, uncrowded and uncluttered, is distinguished by its buildings, lawns and flowers, trees and playing fields. Ten Undergraduate Schools and a Graduate School have emerged to define and carry out the purposes of the institution. The academic program is fully accredited by the Southern Association of Colleges and Schools.

As a land-grant university, Auburn is dedicated to service to Alabama and the nation through its three divisions of instruction, research, and extension. Instruction is the academic process on campus between professors and students. Research is carried on continually to increase knowledge. Extension programs provide educational services and special assistance throughout the state.

Auburn is proud of its graduates, many of whom have distinguished themselves in the professions, business and industry, government and military service, politics, and athletics. Some 85,000 alumni live in the state, the nation, and abroad.

The University traces its beginning to the East Alabama Male College, a private liberal arts institution whose doors opened in 1859. From 1861 to 1866 the college was closed because of the Civil War. The college had begun an affiliation with the Methodist Church before the war. Due to financial straits, the church transferred legal control of the institution to the state in 1872, making it the first land-grant college in the South to be established separate from the state university. It thus became the Agricultural and Mechanical College of Alabama.

Women were admitted in 1892, and in 1899 the name again was changed, to the Alabama Polytechnic Institute. In 1960, the school acquired a more appropriate name, Auburn University, a title more in keeping with its location, size, and complexity. The institution has experienced its greatest growth since World War II, and today enrolls 18,100 students, the largest on-campus enrollment in the state. The majority are Alabama residents.

Auburn University at Montgomery was established as a branch campus in 1967. The institution has developed rapidly, especially since moving to a new 500-acre campus just east of Montgomery in 1971. The AUM enrollment now stands at 4,400.

Purpose of the University

Auburn's responsibility as a University is to maintain an environment of learning in which the individual and society are enriched by the preservation, transmission, and creation of knowledge. This obligation embraces Auburn's

continuing commitment to its land-grant traditions as well as its consciousness of involvement into a dynamic and complex institution whose programs of instruction, research and extension must be ever pertinent to the needs of a changing social order.

Auburn University, therefore, is dedicated to these purposes:

Providing for its students, within the resources of the institution, educational opportunities of a liberal character as well as those of a specialized nature;

Developing graduates whose knowledge, intellectual discipline, and awareness of the morality of individual action will be manifest in service to their fellow man and to the state and nation;

Conducting a broad program of faculty, undergraduate and graduate research, both basic and applied, to stimulate the faculty and students in their quest for knowledge, to promote their intellectual growth and development, to broaden the foundations of knowledge, to increase understanding of today's and tomorrow's world, and to aid society in resolving its scientific, technological and social problems;

Creating and implementing effective programs of education and service which will extend the scientific and cultural resources of the University to individuals, communities, institutions, and industries, thereby contributing to an improved technology, better environmental and health conditions, enhancement of the general level of living, and the development of more responsible citizenship;

Encouraging scholarly and creative effort in the arts, humanities, and sciences so that the University may serve its students and the community at large as a vital source of cultural enlightenment and as a stimulus toward their participation in the intellectual life; and

Reassessing continuously the value of particular objectives and programs of the University in order to make them accord with new knowledge and changing social conditions; and as a part of this reassessment to seek ever more efficient and imaginative means of fulfilling the University's purposes.

Research

Research is a major responsibility of Auburn University. In the early years investigation and discovery were largely confined to scientific areas. More recently research has embraced humanistic fields and creativity in the arts as well. The creation of knowledge by faculty and students is encouraged; steady growth in programs of basic and applied research find a direct parallel in the institution's increasing percentage of graduate enrollment.

The Agricultural Experiment Station was established in 1887 to conduct research, acquire information, and promote scientific investigation in agriculture. The Engineering Experiment Station was established in 1929 to assist industries in manufacturing processes and to develop natural resources. The Water Resources Research Institute began in 1963 to promote research and the training of scientists in water resources.

Auburn's fastest growing research area is sponsored research—an activity annually involving a multi-million dollar program of contracts and grants, supported by federal, state, and private agencies; all of which bears witness to the University's research capability.

Extension

Extension, another of Auburn's principal responsibilities, involves developing and carrying educational services to the farms, homes, industries, communities, and municipalities of the state. The Cooperative Extension Service has provided such services to Alabama's 67 counties since 1914. Included are programs for agriculture and natural resources, home economics, community resource development, and youth activities.

Extension and continuing education programs are available through the Engineering Extension Service, the Schools of Architecture and Fine Arts, Arts and Sciences, Business, Education, Pharmacy and Veterinary Medicine. In addition, the Office of Continuing Education conducts a large number of noncredit, community-oriented short courses to provide background for further study, cultural development, and renewal of professional skills.

Also, Educational Television presents public service programs, and the University library cooperates with public libraries to make materials available throughout the State. Several specialized extension programs such as the Office of Public Service and Research, the Continuous Professional Development Program, the Energy Extension Service and the Auburn Technical Assistance Center provide additional dimensions of service to the people of Alabama.

Instruction

Instruction of students is the primary mission of the University. In the classroom, the laboratory, the library, Auburn University's goals are to quicken the student to reach his full potential, instilling respect for intellectual inquiry and understanding of cultural tradition; and to equip him with the knowledge and skills which he will need in a demanding and increasingly complex society.

The University faculty offers specialized instruction leading to the bachelor's degree in 138 fields in 58 departments, the master's degree in 52 fields, and the doctorate in 29 areas. The faculty and curricula are organized into 10 schools: the *School of Agriculture*, the *School of Architecture and Fine Arts*, the *School of Arts and Sciences*, the *School of Business*, the *School of Education*, the *School of Engineering*, the *School of Home Economics*, the *School of Nursing*, the *School of Pharmacy*, the *School of Veterinary Medicine*, and the *Graduate School*.

Auburn University at Montgomery offers the baccalaureate and the master degrees.

On the Auburn campus, military instruction is available in Air, Military, and Naval Science basic and advanced programs.

Liberal Education Program

The University's instructional program for undergraduates specifies that each student complete a component of general studies in addition to the requirements of his School or departmental major: this general work covers a

foundation year of courses in English composition; world history, art history, or literature; natural science; mathematics or philosophy; and physical education; and is to be taken during the lower-division years, primarily at the freshman level. A certain number of hours must also be completed in elective courses lying outside the student's major area, these to be taken, in part at least, during the upper-division years.

The goals of this "experience in breadth" are to some extent intangible; the development in the student of the values of tolerance, intellectual honesty, and a capacity for reflective judgment. More specifically, it is hoped that the student will acquire also an ability to order his thoughts in a clearly expressed and reasoned manner; attain a grasp of the scientific method and discipline; develop some understanding of his culture and its backgrounds; and come to perceive the vital issues of our common life as citizens in a complex and changing world.

The minimal University requirements for all students are listed below; however the student should consult the appropriate curriculum model in his School for complete requirements.

Requirement	Hours	Option
English Composition EH 101-102-103 (3-3-3)	9	
History or Literature	9	World History 101-102-103 (3-3-3) or Technology & Civilization 204-205-206 (3-3-3) or World Literature (EH) 260-261-262 (3-3-3) or Art History 171-172-173 (3-3-3)
Natural Science	minimum of 10	Biology 101-102-103 (5-5-5) 101-104 (5-5) Chemistry 103-104 (5-5) 101-102-104 (2-3-5) Geology 101(5), 102 (5), 103 (5), 110 (5). Physics 205-206 (5-5) Physical Science 100-101 (5-5)
Mathematics or Philosophy	minimum of 5	Mathematics 100 (5), 140-161 (5-5), 151-161 (5-5) 160-161 (5-5) Philosophy 202 (5), 210 (3), 211-212 (3-3), 214 (3), 216 (3).
Physical Education	3	See page 268 for the various options for meeting this requirement offered by the Department of Health, Physical Education and Recreation.
Electives or Area Requirements	minimum of 20	Additional hours of liberal education studies will consist of coursework in two broad academic areas other than that in which the student's own major field lies (Humanities and Fine Arts, Social Sciences, Mathematics and Natural Science), with no less than one course in each area.

English Composition Requirements

No substitution for the freshman English requirement is permitted.

Credit in freshman English composition earned at another institution may be allowed on transfer as follows, except that no grade less than C will be accepted.

1. If the transfer student has fewer than three quarter hours of credit in freshman English composition, no credit is allowed. If he has three quarter hours credit in the first course of an English composition sequence, he must complete both EH 102 and 103.
2. If the transfer student has four quarter hours of credit in the first course of a three-course sequence, he must complete EH 102 and 103.

3. If the transfer student has either four or five quarter hours of credit in the first course of a two-course sequence, he must complete EH 103.
4. If the transfer student has three semester hours of credit in the first course of a two-course sequence, he must complete EH 103.
5. If the transfer student has earned eight or more quarter hours and has met the first year English composition requirement of the other institution, credit may be allowed for EH 101-102-103, provided the minimum of eight hours involves no duplication. A total of 12 hours may be accepted toward the graduation requirement when the 12 hours of work represents a continuous course sequence at one school. Students entering an undergraduate school at Auburn University after receiving a bachelor's degree from another accredited college or university are exempted from meeting these regulations.
6. No student failing a freshman English composition course at Auburn will be permitted to transfer credit from another school to offset that F, but must repeat the course in residence at Auburn.

All transfer students are directed to clear their freshman English composition credits with the Registrar as soon as possible after enrolling at Auburn University.

History—Literature Requirements

One of the purposes of the University's Liberal Education Program is to give the student an understanding of his culture and its backgrounds. Course sequences designed especially for this purpose are those in world history, world literature, technology and civilization, and art history. Students must earn nine hours of credit in one of these sequences.

Credit in history or literature earned at another institution may be allowed on transfer as shown below in meeting this particular requirement. The student's dean may require a C grade for a course to transfer.

1. If a transfer student has three or four quarter hours of credit in the first course of a three course sequence in history or literature, he must complete HY 102 and 103, HY 205 and 206, AT 172 and 173, or EH 261 and 262.
2. If a transfer student has four or five quarter hours of credit in the first course of a two course sequence, he must complete HY 103, HY 206, AT 173, or EH 262.
3. If a transfer student has earned eight or more quarter hours in a history or literature area and has completed the standard history or literature requirement of the other institution, he may be excused from this particular requirement in the Liberal Education Program.
4. If a student enters an undergraduate school at Auburn after receiving a bachelor's degree from an accredited university, he may be exempted from the history-literature requirement unless his curriculum major or minor specifies one of the four sequences described in this section.

Physical Education Requirements

Physical education is required for three consecutive quarters. Only one credit per quarter is permitted or transferable to meet the three quarter requirement.

Unless otherwise approved by his dean, each student who lacks physical education must register for an activity course in the first and succeeding quarters of residence until all requirements are met or until he becomes 26 years of age.

Students transferring from an institution not requiring physical education will have their physical education requirements reduced by the number of full-time quarters (15 hours credit per quarter passed) in residence at the former institution. Students who transfer from an institution requiring physical education will have their physical education requirements reduced by the number of quarters of physical education completed at the former institution.

Each student must file a medical record form with the Student Health Center and a physical education classification form with the Department of Health, Physical Education and Recreation before assignment of activities can be approved.

Libraries

The Ralph Brown Draughon Library, with branch libraries maintained in the School of Architecture and Fine Arts and in the School of Veterinary Medicine, is the main library. An undergraduate reading room, in which reference works are available, is maintained in Haley Center Sunday through Thursday when school is in session.

Current holdings include 1,000,000 bound volumes and 622,136 volumes and items in microformat. The library is a depository for government documents and lists among its serial subscriptions more than 7,500 periodicals and 155 newspapers. Special collections include an Alabama Collection, 65,696 maps and other special materials.

Library staff members offer assistance in the location and use of library materials at the General Information and Humanities Desk, and at desks in the Social Sciences Department, Science and Technology Department, Special Collections, and the Microforms and Government Documents Center. Desks are also maintained in the two branch libraries and in Haley Center.

A convenient open-shelf arrangement of the main collection makes material readily accessible. Comfortable, well-lighted study areas are available, including carrels which graduate students and faculty may reserve.

Archives

The Archives, located in the Ralph Brown Draughon Library, was established in 1964 to house University records and manuscript collections. The Archives has 465 official and personal manuscript collections; 1,300 oral history and recorded sound tapes, 22,000 prints and negatives and 900 rolls of microfilm available for research use.

Computing and Data Processing

Services of this type are provided by the Division of Computing and Data Processing. The Division has three component units: Computer Services, Management Information Systems, and Administrative Information Systems.

Computer Services operates central computing equipment in support of Instruction, Research, Extension, and Administration. During 1979-80, the IBM 370/158 and IBM 370/138 computers are scheduled to be replaced by IBM 3032 and IBM 3031 machines, for academic computing and administrative computing respectively. All use of these large computers is coordinated through heads of academic and administrative departments. Request forms for services are available in 144 Parker Hall.

Computer Services also operates two smaller computers, free of charge, for support of instruction. The HP2000 and PDP 11-70 computers, with associated terminals, are located in the Building. Input-output stations, both interactive and batch, are provided in several locations on the campus.

Management Information Systems provides systems analysis and programming services in support of the University Business Office and other units; Administrative Information Systems does likewise for the Registrar's Office and other units.

The Division of Computing and Data Processing is a service organization, and does not conduct an academic program in Computer Science, although some staff members participate as faculty in Computer Science programs in the schools of Agriculture, Arts and Sciences, Business, and Engineering. Inquiries concerning these academic programs should be directed to the deans of these schools; some information is contained in the sections of this catalog pertaining to these schools.

Revenues

Auburn University receives financial support from student fees, state and federal appropriations, endowments, income from clinical services, sales, gifts, grants, contracts, and other sources. The largest single source of income is state appropriations.



Student Personnel Services and Programs

THE UNIVERSITY'S STUDENT PERSONNEL services and programs, which are designed to assist students with their in-class and out-of-class experiences, are organized as follows:

The **Dean of Student Services** supervises the Offices of Admissions, High School and Junior College Relations, Pre-College Counseling, Registrar, Student Financial Aid, and University Placement.

The **Dean of Student Affairs** supervises the Student Government Association, Auburn Union, student activity fee projects, student organizations, religious life, student communications and radio, fraternities, student discipline, and recreational services and intramurals.

The **Dean of Student Life** supervises University residence halls, sororities, Caroline Draughon Village, coordinates off-campus housing, and serves as social director of the University.

The **Special Assistant to the President** supervises the Food Service, Student Development Service, Student Health Service, and coordinates the University's program of compliance with federal regulations.

Student Services

Admissions

AUBURN UNIVERSITY is an equal opportunity educational institution and, as such, does not discriminate in its admissions policy on the basis of race, color, sex, creed, handicap, age or national origin. Preference is given to the admission of Alabama residents at the undergraduate level; in considering applications to professional schools or programs with restrictive admissions policies, the length of residency in the state will be a factor.

Applications from out-of-state residents will be accepted for all curricula except Pre-Veterinary Medicine. However, the number of nonresidents who are admitted will be determined by the availability of facilities and faculty.

Application to any undergraduate school or curriculum of the University must be made to the Admissions Office, Auburn University, Auburn, Alabama 36830. Application forms and instructions can be obtained from the Admissions Office. Application to the Graduate School must be made to that School.

Individuals may apply for entrance to any quarter of a calendar year as early as October 1 of the preceding year.* Because of the large number of applications, credentials should be submitted at the earliest possible time. In all cases, complete credentials along with the physical examination report

*Applicants to Veterinary Medicine will be admitted in the Fall Quarter only. See page 177.

must be filed at least three weeks before the quarter's opening. The University reserves the right to establish earlier deadlines should circumstances warrant such action.

A \$10 processing fee must accompany all admission applications and is neither refundable nor applicable to other fees. Responses on the application forms and on related materials must be complete and accurate; entrance may be denied or registration cancelled as a result of false or misleading statements.

An applicant may receive provisional acceptance after he submits the application form and current academic documents. However, he must complete and return a medical examination report at least three weeks before the quarter opens. The University provides the medical report form; it also may require additional medical examinations if such appear advisable, and it may refuse admission to any individual whose health record indicates that his health or the University community might be adversely affected by his attendance.

Each applicant must furnish satisfactory evidence of good character. The University may deny admission to those whose presence is deemed detrimental to the institution or its students.

Pre-College Counseling

In order to help entering freshmen and transfer students choose fields of study, and to adjust to their first quarter at the University, Auburn provides pre-college counseling.

Freshmen entering Fall Quarter attend counseling sessions on campus during the summer prior to entrance. In these sessions, students meet faculty members, administrators, and student leaders, and plan with their advisers a schedule of their first quarter of college work.

Freshmen entering the University any quarter other than Fall Quarter are usually required to report to campus one day early for counseling.

Transfer students may meet with advisers during the regular pre-registration period for the quarter in which they plan to enroll. Transfers will plan their schedules after their transcripts have been evaluated. A convocation for all transfer students is held on the first day of registration prior to the beginning of classes.

Admission of Freshmen

Enrollment limitations for freshmen have been established by curricula and schools, in proportion to available faculty and facilities. Favorable consideration for admission will be given to accredited secondary school graduates whose college ability test scores and high school grades give promise of success in college courses.

All secondary school students planning to apply for admission to Auburn should emphasize the following high school courses: English, mathematics, social studies, sciences, and foreign languages. A minimum of 16 high school units is required for admission. Four of these units may be vocational subjects.

Alabama residents are required to take the American College Test (ACT) on one of the announced national testing dates. Applicants from other states may present scores from either the ACT or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board. High school students may secure application forms from their principals or counselors. Scores on these tests are used as a partial basis for admission, for placement in English, chemistry, and mathematics, and for awarding University scholarships and loans.

Prospective freshmen who take the ACT or SAT, list Auburn as a score recipient and meet freshman entrance requirements will be mailed a pre-printed application completed from information supplied to the testing service by the student.

At least one unit of college preparatory mathematics (algebra or geometry) is required for admission to any curriculum in the University. Curricula which list Mathematics 140 or 160 assume the student's competence in the mathematics taught in high school geometry and second year algebra. Curricula which list MH 161 as a first college course in mathematics presume, additionally, competence in high school "analysis" (the function concept, graphs of functions, the trigonometric functions).

A deficiency in the latter material can be remedied by taking MH 160. However, Auburn University offers no course comparable to high school geometry or to first and second year high school algebra. MH 140 can serve as a refresher course, but credit is not allowed for both 140 and MH 160. MH 100 is not a preparatory course for any of the above college-level courses.

Applicants of mature age who are not high school graduates may be considered for admission if their educational attainments—through testing—are shown to be equivalent to those of a high school graduate. The tests used include the USAFI General Educational Development Test, the American College Test and/or other tests recommended by the Admissions Committee. Applicants from nonaccredited high schools will be considered on an individual basis by the Committee.

Early Admission—A student of high academic promise may be admitted directly from the eleventh grade without a diploma. Basic requirements for early admission include:

1. Proper personal qualifications.
2. Superior competence and preparation, evidenced by the high school record and college aptitude test scores (ACT, SAT or other tests prescribed by the University Admissions Committee).
3. A letter from the high school principal assessing the applicant's emotional and social maturity, and readiness for college work.

Additional information on procedure is available at the Admissions Office.

Advanced Standing—Students with superior preparation may be placed in advanced programs suited to their ability and academic background. Individuals with special competence may qualify for advanced placement or credit on the basis of high school grades, scores on college ability or achievement tests, the College Level Examination Program (CLEP) tests, proficiency tests, and military courses. See page 36.

Admission of Transfer Students

An applicant who was not eligible for admission to the University when he graduated from high school must present a minimum of 96 quarter hours or 64 semester hours of college credit to qualify for consideration as a transfer.

For residents of Alabama or other states who are party to the Southern Regional Education Board*, a satisfactory citizenship record, an overall C average or better on all courses attempted, and eligibility to re-enter the institution last attended are required for transfer admission. Residents of states not affiliated with the SREB must present at least a B average in addition to the other requirements. Entrance examinations may be required of applicants transferring from colleges with which the University has had little or no experience.

An additional requirement for applicants wishing to enter the School of Business is the satisfactory completion of the first course in college calculus with a grade of C or better.

Transfer Credit—The amount of transfer credit and advanced standing allowed will be determined by the appropriate dean and the registrar. The dean will determine acceptance of D grades; credit in freshman English is allowed only on grades of C or better. See page 12. The maximum credit allowed for work completed in a junior college will not exceed the number of hours required in the first two years of the student's curriculum at Auburn.

Students transferring from unaccredited institutions or programs may be granted provisional credit. When such credit is allowed, the final amount of credit will be determined upon completion by the student of one year of course work at Auburn University. If a C average is not achieved, the amount of credit will be reduced in proportion to the number of hours in which the student fails to earn a C average or better.

Transfer Within the System

Auburn University maintains a branch campus at Montgomery, Alabama. An undergraduate enrolled at either of Auburn's campuses who wishes to transfer to the other campus will be considered as a transfer student from any other accredited college. Because there is a slight difference between some curricula and courses at the two institutions, transfer credit and advanced standing will be determined by the academic unit and the registrar at the campus to which the student is moving.

Admission of Transient Students

A student in good standing in an accredited college may be admitted to the University as a transient student when faculty and facilities are available.

To be eligible for consideration, an applicant must submit an application, an acceptable medical report and a letter of good standing bearing the signature of the dean or registrar of the college in which the applicant is currently enrolled.

Permission to enroll is granted for one quarter only; a transient student who wishes to re-enroll must submit a new application. Transient status does

*The fourteen states participating in the Southern Regional Educational Board's compact are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

not constitute admission or matriculation as a degree candidate. The transient is, however, subject to the same fees and regulations as a regular student except for the physical education and continuation-in-residence requirements.

Admission of Unclassified Students

For residents of Alabama and other states affiliated with the Southern Regional Education Board, admission to undergraduate programs as an Unclassified Student may be granted on the basis of the bachelor's degree from an accredited college. For residents of states not affiliated with the SREB, Unclassified Student enrollment may be allowed on the basis of the bachelor's degree and an overall B average. Unclassified students must submit the same admissions credentials as transfer applicants.

Admission of Special Students

Persons who cannot meet freshman admission requirements but who are otherwise adequately prepared for University courses may be admitted as special students on approval of the Admissions Committee and the dean concerned. Course credits earned by special students generally cannot be used toward a degree at Auburn University.

Admission of International Students

The University welcomes admission inquiries from international students. Because of limited facilities, however, only those students who are academically strong will be given serious consideration for admission. Also, the international student should be proficient in English. In all cases, English proficiency is determined by satisfactory results on the Test of English as a Foreign Language (TOEFL), offered by the Educational Testing Service, Box 899, Princeton, N.J., 08540, U.S.A. The student must submit satisfactory results on the Scholastic Aptitude Test of the College Entrance Examination Board, also offered by the Educational Testing Service.

An international student first should send all of his academic credentials to the Admissions Office for evaluation. If he appears to be qualified, and shows promise of success in his chosen field of study, he will then be asked to make formal application. The application must be accompanied by a recent photograph and an application fee of \$10 (not refundable). If the applicant presents satisfactory academic credentials, test results, and evidence that he has sufficient funds to meet his college expenses (there is no financial assistance for undergraduate international students), he will then be sent an acceptance and the form I-20, the authorization for a student visa. For further information, prospective students should write to the Admissions Office, Auburn University, Auburn, Alabama 36830, U.S.A.

Admission of Auditors

When faculty and facilities are available, an individual who does not seek admission for course credit may audit a lecture course or the lecture portion of a course upon approval by the Admissions Office, the dean, and the head of the department involved. A formal application must be filed, but the \$10 application fee and the physical examination report are not required. (See Auditing Privilege, page 30.)

Admission to Graduate Standing

Admission to graduate standing is granted only by the University Graduate School. A \$10 application fee is required. A bachelor's degree or equivalent from an accredited college or university and submission of satisfactory scores on the Aptitude Test of the Graduate Record Examination are required for Graduate School admission. Applicants for admission to doctoral programs must submit Advanced Test scores also. Certain departments require applicants to master's degree programs to take the Advanced Test.

The undergraduate preparation of each applicant must also satisfy the requirements of a screening committee of the school or department in which the student plans to major. A student in good standing in a recognized graduate school who wishes to enroll in summer session, off-campus workshop, or short session, and who plans to return to his former college, may be admitted as a graduate transient. For further information, see the section on the Graduate School and also the Graduate School Bulletin.

Readmission

Students who have previously attended Auburn and who wish to re-enter must secure a registration permit from the Registrar's Office. Former students who have attended another college for at least one quarter or semester must be eligible to re-enter that institution, if they desire to return to Auburn. Students who attended another institution for more than one quarter must have earned an overall C average or better to be eligible to re-enter Auburn. Two transcripts from the institution attended must be supplied to the Registrar.

Alabama and Non-Alabama Student Policy

For the purpose of assessing fees, applicants shall be classified as Alabama or non-Alabama students. Non-Alabama students except graduate students are required to pay a tuition fee.

An Alabama student is a person who shall be a citizen of the United States or a resident alien and who shall have resided and had his habitation, home, and permanent abode in the State of Alabama for at least 12 months immediately preceding his current registration. In applying this regulation, "applicant" shall mean a person applying for admission to the institution if he is married or 19 years of age, or, otherwise, it shall mean parents, parent or legal guardian of his or her person. If the parents are divorced residence will be determined by the residency of the parent to whom the court has granted custody. A student shall be classified as an Alabama student when his parent(s) or legal guardian establishes domicile within the state and is employed full-time in a permanent position in the state.

In the determining of an Alabama student for purposes of assessing fees, the burden of proof is on the applicant. An applicant can change his status from non-Alabama to Alabama student only by actually and physically coming into the state for the required period with the intention of residing within the state.

A non-Alabama student may apply in writing for reclassification prior to any subsequent registration. To qualify for reclassification as an Alabama student, the applicant (1) shall present evidence of having resided in Alabama

for 12 consecutive months preceding his request for reclassification, (2) shall submit evidence that he has met the usual and expected obligations of an Alabama citizen, and (3) shall file a declaration of intent to reside in Alabama. An alien shall have resided in Alabama for 12 months and must present U.S. Immigration and Naturalization certification that he is a resident alien. If the application is supported by evidence satisfactory to the University that the student then qualifies as an Alabama student, his classification may be changed for future registrations.

Members of the Armed Forces who are on active duty and who have an Alabama Home of Record and their dependents shall not be liable for non-Alabama tuition. Verification of the Alabama Home of Record must be attested to by military authority for a minimum period of one year before entry of the student.

The registrar shall have the responsibility for determining whether a student shall be classified as an Alabama or non-Alabama student. The decision of the registrar shall be subject to review by the President or his designated representative upon written request of the applicant.

Fees and Charges

Auburn University's fees have remained somewhat lower than those charged by similar institutions in the Southeast and in other sections of the country. As institutional costs have risen, small increases in fees have been authorized from time to time by the Board of Trustees. Every effort is made, however, to hold fees and charges at a minimum.

Payment of Fees and Charges—Students are expected to meet all financial obligations when they fall due. The University reserves the right to deny admission to or to disenroll and withhold transcripts of any student who fails to meet promptly his financial obligations to the University. It is each student's responsibility to be informed of all registration and fee payment dates, deadlines, and other requirements by referring to the official calendar of events in the catalog, announcements printed in the *Plainsman*, or disseminated by other means from time to time. Where necessary, students should inform their parents of the deadline dates, and the necessity for meeting them.

Checks—Checks given in payment of fees and charges are accepted subject to final payment. If the student's bank does not honor the demand for payment and returns the check unpaid, the student will pay the applicable late penalty fee of \$5 or \$10. If payment is not cleared promptly, the student's registration will be cancelled.

Veterans—Veterans enrolled under the federal GI Bills P.L. 358 and P.L. 634 receive their allowances directly from the Government and are responsible for paying their fees and charges on the same basis as other students. This does not apply to P.L. 894 or P.L. 815.

The following fees and charges are in effect at this time. However, since the catalog must be published well in advance of the next school year, it is not always possible to anticipate changes. **Thus the fee schedule may have to be revised. Every effort will be made to publicize changes as far in advance as possible.**

Any collection costs or charges with all attorneys fees necessary for the collection of any debt to the University will be charged to and paid by the debtor.

Foreign Students - Under Contract—For those foreign students who come to the University under a contractual arrangement that requires special administrative and programming arrangements beyond those of the regular academic program of the University, a special administration/management/program fee will be negotiated.

Basic Quarterly Charges

Students should be prepared to complete registration by payment of fees and charges, upon notice, two to three weeks before the beginning of the quarter. See fee payment dates in the Calendar, pages 6 to 7.

ENROLLMENT FOR TEN OR MORE CREDIT HOURS

University and Student Activities Fee (all curricula except Veterinary Medicine)	\$200.00
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University and Student Activities Fee for Veterinary Medicine	300.00
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The University Fee is used to meet part of the cost of instruction, physical training and development, laboratory materials and supplies for student's use, maintenance, operation, and expansion of the physical plant, Library, Student Health Services and Student Activities.

The Student Activities portion of the fee supports such activities on campus as intercollegiate athletics, exhibits, *Glomerata*, intramural sports, *Plainsman*, religious life, social affairs, student government, student union activities and operations, and *Tiger Cub*. This fee includes 25¢ held in reserve to cover unnecessary damage to University property by students.

Non-Alabama Fee	\$200.00
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Additional fee charged all non-Alabama undergraduate, special, and unclassified students taking 10 or more hours. This fee is not charged to graduate students.

ENROLLMENT FOR FEWER THAN TEN CREDIT HOURS

Registration Fee	40.00
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Additional fee per credit hour	16.00
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No additional charge is made beyond 10 hours. Students who register for 10 or more hours will pay a maximum of \$200.00 as Alabama students or \$400.00 as non-Alabama students. The \$40.00 registration fee is remitted to full-time faculty and staff taking no more than five credit hours. All students except faculty and staff are eligible to participate in Student Health Services and Student Activities.

Clearing for Graduation Fee	40.00
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A student who is a candidate for a degree in a quarter in which no credit work is taken is required to register in such quarter as a prerequisite to graduation. (For members of the faculty and staff the charge shall be reduced to \$5.) Graduation fee is to be paid in addition to this charge.

Other Fees & Charges

Fee for Late Registration or Late Payment	\$5.00-10.00
All students, regardless of classification, must clear fees and tuition by the deadline set by the University, or pay the following additional charges:	
Through official schedule adjustment period.	5.00
Effective with beginning of classes	10.00
Achievement Certificate Fee	5.00
Application Fee	10.00
The application fee must accompany all application for admission. Not refundable nor applicable to registration fees. (See section on Admissions.)	
Auditing Fee (per course)	16.00
Any student who pays less than full fees must pay this fee for auditing a course. (Not charged to faculty and staff.)	
Change in Course fee	\$ 5.00
Charge is made in cases where student is not required or advised by the University to change, but has the Dean's permission to do so after Schedule Adjustment period.	
Change in Curriculum Fee (if change made after classes begin)	5.00
Correspondence Study Course Fees	
Registration Fee	5.00
Additional fee per credit hour	16.00
Duplicate Diploma Fee	10.00
Doctoral Dissertation Mic. filming Fee	30.00
Equivalency Examination Fee (GED) (each)	12.00
Field Laboratory Program—Off Campus Courses	
Registration Fee	15.00
Additional fee per credit hour	16.00
Graduate Thesis and Dissertation Binding Fee (per copy)	4.50
Three to five copies usually required.	
Graduation Fee	10.00
Payable at beginning of the quarter in which the student expects to receive a degree. Deadline—two weeks before Graduation (transferable to next quarter or refundable if student fails to qualify).	
Cap and Gown Rental Fees (for Graduation Exercises)	
(includes retaining of tassel)	
Bachelors—cap and gown	4.50
Masters—cap, gown, and hood	8.25
Doctorate—cap, gown, and hood	9.75
Criminal Justice LE 464	
Journalism Internship JM 425	
Political Science Internship PO 450	
Fees will be one-half the full University Fee and one-half the non-Alabama student fee if applicable.	

Music Fees 35.00

This additional fee to be paid at the time of registering for each applied Music Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.

Rent for Dormitory Room, per quarter 115.00 to 215.00

Rent for Married Students Apartments, per month 95.00 to 140.00

Meal Plans (See section on Food Services under Student Services and Programs.)

Quarterly meal plans range up to (plus tax) 411.60

ROTC Uniform and Equipment Deposit (Air Force) 30.00

All students, both Basic and Advanced, are required to deposit the sum of \$30 with the University Bursar, prior to enrollment in ROTC, except for Army and Naval ROTC. The deposit, less \$1.50 per quarter for ROTC activities and uniform repairs, is refunded to the student on completion of the program or withdrawal therefrom and the return of the uniform and other supplies.

Service and Penalty Charges

Registration fees billed home,

To parents, to Trust Funds, to companies, or other sponsors 2.00

Charge for each returned check 2.00

Failure to pay fees due or to make returned check good on notice where two or more notices are required 5.00 or 10.00

Notice: CHECKS ARE ACCEPTED SUBJECT TO COLLECTION

Special Services Fees

Cooperative Education Program 15.00

Internship Fee-Veterinary Medicine 15.00

Postdoctoral Fellow 15.00

Transcript Fee 3.00

Registration Fee Cancellations or Refunds

If the student who has paid fees before the opening of the quarter officially resigns *prior* to the beginning of the quarter, all fees except late fees will be refunded. If the student resigns within the first two weeks of classes, all fees less charges will be refunded except the sum of \$40 for handling. Also if the student has used the University Health Service during that quarter, the \$15 Health Services Fee will be retained. No refunds will be made in case of withdrawals after two weeks of classes except in cases of resignation caused by personal illness (physician's statement required) or call into military service (copy of activation orders required). Students suspended for disciplinary reasons are not eligible for refund or cancellation of accounts due.

If student received student aid in the form of a scholarship, grant, or loan, any refunds due would be applied back to the student aid fund.

Financial Aid

The Office of Student Financial Aid at Auburn University provides financial assistance to students who need aid in order to attend the University. The University believes that the amount of aid granted should be based on financial

need. To determine need, Auburn uses the ACT Need Analysis System of the American College Testing Program. Students seeking assistance are required to submit the Family Financial Statement to the ACT Program annually. Applications for aid should be completed in January or February of the year prior to the academic year in which the student will need assistance. Application materials and a brochure describing available aid programs may be obtained from the Office of Student Financial Aid, 312 Mary Martin Hall.

The financial aid for which students may apply includes scholarships, grants, loans and part-time employment.

Scholarships may be awarded to undergraduates with financial need who have shown high academic attainment and promise. *Basic Educational Opportunity Grants* and *Alabama Student Assistance Program Grants* are provided to undergraduate students who can demonstrate need. *Supplemental Educational Opportunity Grants* are available, in limited number, to undergraduates with exceptional financial need.

National Direct Student Loans and *Institutional Loans* provide long-term, low interest loans to students who can demonstrate need. Long term *Federal-State Guaranteed Loans* may be obtained from commercial lending institutions.

The *College Work-Study Program* provides part-time employment for students who demonstrate financial need. The *Health Professions Loan Program* makes available long-term loans for students in Pharmacy and Veterinary Medicine. The *Law Enforcement Education Program* provides loans or grants to full-time law enforcement officers.

Graduate students may be eligible for teaching and research assistantships and traineeships. Information is available from the head of the department of the student's major field.

Employment

Students seeking part-time employment while attending the University should contact the Student Employment Service. As a referral agency, the service assists students in finding employment on campus as well as maintaining bulletin boards with notices of job openings with businesses and industries in the local area. Applicants for employment are referred to prospective employers on the basis of the date of application and the skills of the applicant.

Auburn University employs in excess of 1,500 students on an hourly basis. Students may work a maximum of 20 hours per week while enrolled for six or more quarter hours. The number of hours set by off-campus employers may vary but usually range from 10 to 30 hours per week.

Applications and additional information may be obtained from the Student Employment Service, Office of Student Financial Aid, 315 Mary Martin Hall.

Placement Service

The University Placement Service assists, without charge, students and alumni in securing business and professional positions through its contacts with potential employers. Representatives of firms and agencies visit the

campus each quarter for personal interviews with students. Seniors and graduate students who desire information and assistance should confer with the Director, 400 Martin Hall.

For information on employment while in University residence, see the section on Information for Prospective Students.

Academic Regulations

Registration and Scheduling

Every student who makes use of the instructional staff and facilities of the University must register and pay fees. This rule also applies to students who are clearing incomplete grades, clearing for graduation, or working on graduate thesis. The University Calendar on pages 6 and 7 lists the dates for registration, schedule adjustment and distribution, fee payment, and final registration. The student's dean authorizes and approves the subjects for which the student registers, as well as any changes or adjustments in his schedule. Courses should be scheduled in sequence as they appear in the curriculum model.

The student is urged to register during the computer-assisted registration held in the quarter preceding the term for which he is registering. A currently enrolled undergraduate who fails to do so is charged a late fee. Fall Quarter schedule distribution and fee payment are accomplished by mail in September. A final registration is held one to two days before the first day of classes.

When registering, the student is responsible for observing the prerequisites or corequisites of courses. Any waiver of these requirements must be approved by the instructor and/or his department head. Also, waiver of the junior standing prerequisite for courses that may be taken for graduate credit must have the Graduate School dean's approval.

Late registration must be authorized by the student's dean, and a late fee will be charged. A student's class load may be reduced by his dean. No student will be registered after the tenth day of classes without the approval of the Vice President for Academic Affairs.

Course credit completed at another college or university while the student is concurrently enrolled at Auburn University will not be counted toward his degree without prior permission from his dean.

Registration and Readmission Permits

Entering freshmen and first-quarter transfer students obtain permits to register from the Admissions Office. Previously enrolled undergraduates secure their permits from the Office of the Registrar; graduate students receive theirs from the Graduate School.

A student seeking readmission who has attended another college since he was enrolled at Auburn University must (1) be eligible to re-enter the last institution attended and (2) have a C average overall on course work attempted at other colleges attended two or more terms. Two official transcripts from each institution attended must be furnished to the Registrar's Office.

Change of Major or Curriculum

A student must have his dean's approval to change to another major within the same School. To change Schools within the University, a permit from the Registrar's Office is required.

Course Load

The maximum load for students in undergraduate curricula is 19 quarter hours. A normal load is 15-19 hours per quarter. With his dean's approval, a student may schedule less than a normal load.

The maximum load may be exceeded under the following circumstances:

1. The academic dean may approve up to 20 hours as a convenient load.
2. On approval of his dean, a student may schedule an overload not to exceed 23 hours if, during his last residence quarter at Auburn University in which he carried 15 or more hours, he passed all work attempted and earned a grade point average of 2.5 or higher. A student who has scheduled fewer than 15 hours during an intervening quarter (or quarters) will retain the overload privilege if all work carried was passed with a minimum grade-point average of 2.5 in each intervening quarter. In special cases the dean may make exceptions to the 2.5 requirement, by written notice to the Registrar.
3. On approval of his dean, a graduating senior who is ineligible to carry an overload may schedule a maximum of 23 hours if the overload will allow him to graduate in that quarter.

A student who registers for work in excess of his approved load may be required by his dean to drop the overload during the Schedule Adjustment period.

Curriculum Model Change

When the University changes a curriculum model, a student in the altered curriculum may be required to complete the subjects and hours placed above the level to which he has progressed. He will not, however, be required to complete additional subjects placed in the curriculum below the level he has achieved. Courses shifted from one class level to another are exempt from this latter provision. The student's dean will determine the revised subject requirements, and the Registrar will determine the revised total hour and grade-point requirements. In no case, however, will the changed curriculum compel a student to accumulate additional hours and grade points in order to graduate.

Classification

The undergraduate's classification will be determined by the number of credit hours he has earned at Auburn and elsewhere.

<i>Freshman</i>	47 or fewer quarter hours
<i>Sophomore</i>	48-95 quarter hours
<i>Junior</i>	96-143 quarter hours
<i>Senior</i>	144 or more quarter hours

The numbering sequence for identifying the classification of students is as follows: 1, Freshman; 2, Sophomore; 3, Junior; 4, Senior; 5, fifth year for

Pharmacy, Architecture, and Veterinary Medicine; 10, Unclassified (non-degree students); 12, Special and Transient students and auditors only; 6, 7, 8, 9, 11, 13, and 14 are Graduate student classifications.

A student with a baccalaureate degree who undertakes a program for a second bachelor's degree will be classified as an undergraduate.

Auditing

Auditing of courses is restricted, and rarely permitted in laboratory courses. A student's audit privilege is granted only on the approval of the dean and the head of the department of the course involved.

Auditors not previously admitted to the University must be approved for registration by the Admissions Office. They must register and pay appropriate fees. Although listed on class rolls, auditors are not required to take part in classroom discussion, tests, examinations, or reports. They will receive no grade or credit; however, a student who does not attend or attend regularly the audited course will have "non-attendance" indicated by the course on his records.

A student may not change from audit to credit after classes begin, but he may change from credit to audit within the first three weeks of classes. No refund of fees will be made except for changes made during the first two weeks of classes in accordance with University policy.

Class Attendance

The University regards the final grade for a course as a measurement of the student's performance in achieving the objectives of the course. Absence from class sessions, in and of itself, should not determine, though it may well influence, the final grade in advanced courses. With respect, however, to 100-level and 200-level courses, the departments concerned may adopt such absence policies as they deem appropriate, and these shall be presented to each class, preferably in writing, at the beginning of the quarter.

The student shall be expected to carry out all assigned work, including laboratories, and to take all examinations at the class period designated by the instructor. Normally it is difficult to make up laboratories; therefore, the student must attend laboratory sessions during the times for which he is registered. Failure to carry out these assignments or to take examinations at the designated times will result in an appropriate reduction in grade, except as provided in the following paragraphs:

Each instructor shall determine the policy regarding assigned work which he feels is best for his course. In developing this policy the instructor shall consider carefully the nature of the course, the maturity level of the students enrolled in the course, and the consequent level of flexibility which his policy will include. The policy, along with the instructor's requirements for announced and unannounced examination attendance, shall be presented to the class, preferably in writing, at the beginning of the quarter and will govern the actions of the instructor in the course.

Instructors will be expected to recognize and honor official University excuses which may be issued to groups or individuals for absences due to participation in authorized University activities (athletic teams; events of a traditional nature such as the Hutsell Freshman Cake Race; or for absences

directly related to the academic program such as authorized field trips*), and to make allowances for student absences caused by illness or personal emergencies. Absences from classes (with the exception of laboratories and classes which meet only once a week) between the hours of 3 and 6 p.m. on the day of the Wreck Tech parade and the Wilbur Hutsell ODK Freshman Cake Race will be excused for freshmen, members of the band, and cheerleaders. Arrangements to make up missed work shall be initiated by the student. Such arrangements could result in delayed due dates for assignments, or in IN or other deferred grades.

Excuses for student absences of a nonacademic, extracurricular nature will not be issued by the University but will be granted at the discretion of the individual instructor. Any evidence or request for consideration that the student may feel justifies his absence may be presented to the instructor for review.

Excuses for the purpose of attending reserve military training are normally denied.

The regularly accepted time for class procedure to begin shall be 10 minutes after the hour. If the instructor does not appear within 20 minutes after the hour, it may be assumed that the class is cancelled. All classes shall be dismissed promptly on the hour.

In order that the University may have effective class days, it is University policy that all classes will meet as scheduled the last day before holidays and the first day after holidays as designated by the University.

Unresolved problems may be referred to the office of the Vice President for Academic Affairs for resolution.

Examinations

Examinations are classified as (1) final examinations at the end of each quarter; (2) special examinations; and (3) other course examinations as determined by the instructor. The final examination policy is stated below.

Announced tests in undergraduate courses will be administered at a regularly scheduled meeting of the course. Exceptions to this regulation may arise in specialized courses requiring performance or oral tests, and in multiple-sectioned laboratory classes requiring practical laboratory tests. Faculty having sound reasons for scheduling tests at times other than regularly scheduled meeting times are to obtain approval from the department head prior to the beginning of the quarter, and are to present a written schedule of these changes to the class during the first few days of the quarter. Rescheduled tests are not to interfere with other scheduled academic endeavors of the students involved, and an appropriate reduction in regularly scheduled class time is to be given to compensate for the rescheduled test period.

FINAL EXAMINATIONS. A final examination is a desirable means of evaluation in most undergraduate courses. In unusual circumstances, performance tests, term papers, research projects or other forms of evaluation appropriate to the objectives of the course may be substituted for a final examination with the approval of the department head, who will report his action to the dean and

*Field trips will be authorized by the department and dean of the School in which the course is taught. The instructor will issue an official excuse to each student participating in the field trip. Any student may decline participation in a given field trip and receive an appropriate compensating assignment if, following consultation with his instructor, it appears that the field trip would adversely affect his other academic work.

Vice President for Academic Affairs. Faculty not giving a final examination are to present to the class at the beginning of the quarter a written description of how final grades will be determined.

Final examinations should be administered during the hours specified in the quarterly examination schedule. Due to the specialized nature of many small upper-level undergraduate courses and graduate courses, deviations from this requirement are sometimes warranted. Such deviations are to be approved by the Vice President for Academic Affairs, and rescheduled examinations must not interfere with scheduled academic activities of the students involved. The professor teaching a 600-level course shall determine whether a formal final examination is appropriate.

Grades

Final passing grades are A, superior; B, good; C, acceptable; D, passing; and S, satisfactory. Final failing grades are F, failure; FA, failure for excessive absences; XF, absent from final examination and failing at the time; U, unsatisfactory; and WF, officially dropped with permission of the student's dean but failing at time of withdrawal.

A NG, no grade, thesis and dissertation research credit, is assigned to courses 699 Research for Thesis and 799 Research for Dissertation.

An X is assigned if the student is passing but missed the final examination, or if he has incomplete work and is absent from the final examination. An IN is assigned if the student has cleared the final examination but has not completed other required work. Grades of X and IN must be cleared during the student's next residence quarter or they will be recorded as permanent failing grades.

The first four days of each quarter are designated as the Special Examination period to remove X grades. The student will get a permit from his dean in order to make up a missed examination. A grade of IN will be changed by the Registrar upon written notice from the instructor. A final grade may be changed only by the written request of the instructor, with the approval of his department head and dean which must be submitted to the Registrar.

A grade of F and additional penalties may be assigned for academic dishonesty. See the Student Academic Honesty Code section in the *Tiger Cub* for further information.

GRADE ASSIGNMENT FOR CLASS WITHDRAWALS. No penalty shall be assigned for dropping a course on or before the fifteenth day of the quarter. (For courses with fewer than five meetings per week, 15 class days should not be confused with 15 class meetings.)

If a course is dropped after the first 15 days, but by the date of mid-quarter, the instructor shall assign a grade of W (passing) or WF (failing) as the case may be. A course can be dropped with a W after mid-quarter only under unusual conditions. When approval for dropping the course under such circumstances is granted by the student's dean, a W may be assigned only when the instructor indicates that the student is clearly passing the course. Otherwise, a grade of WF is assigned.

GRADE AVERAGE AND QUALITY POINTS. Effective Fall Quarter 1979 a 4.00 grade scale will be used. An A equals 4.00; B, 3.00; C, 2.00; and D, 1.00; and F equals 0.00. Only course work attempted at Auburn University is used in

determining the grade report average and continuation-in-residence requirements. S and U grades do not enter into grade-point computations.

S-U GRADING. Grades of S (Satisfactory) and U (Unsatisfactory) may be assigned only to EDL 798, courses approved to be graded S-U, and courses elected under the S-U option.

A junior or senior with a minimum overall grade average of 2.5 on at least 30 hours of credit earned at Auburn may elect any course to be graded on the S-U option, except for courses required in the freshman and sophomore years or for courses constituting the major as defined by the student's curriculum. A total of 20 credits may be earned at the rate of one course per quarter. The student will receive credit toward his degree for these courses, provided credit is normally accepted in his curriculum for this course work.

An unclassified student may schedule one or more courses on the S-U option with the approval of his dean. Course work completed on the S-U choice by unclassified students may not be applied later to degree requirements should the student become a degree candidate.

A graduate student may enroll in undergraduate courses, except for 400-level courses taken for graduate credit, under the S-U option on his major professor's recommendation.

Students are not permitted to change from S-U grading to conventional grading or vice versa after the schedule adjustment period.

GRADE REPORTS. In compliance with the Family Rights & Privacy Act (Buckley Amendment) of PL 93-380 (Educational Amendments of 1974) one copy of each student's grade report is mailed at the end of each quarter to the student at the address furnished by the student.

Dean's List

The name of every eligible student who meets certain scholastic requirements for a given quarter is placed on a list prepared for the dean of his School. This honor is also noted in the student's permanent record.

To meet Auburn University's requirements for inclusion on the dean's list, the student must be enrolled for 15 or more credit hours exclusive of any S-U option courses, pass all courses attempted for the quarter, and earn a grade-point average of at least 3.40 (on the 4.00 system). Furthermore, the dean of each School has established specific criteria governing inclusion on the list. The special requirements, applied in addition to the University regulations, are listed as follows:

School of Agriculture: 3.70 average.

School of Architecture and Fine Arts: a grade-point average within the upper 10 per cent of the full-time students enrolled in a given department.

School of Arts and Sciences: 3.75 average.

School of Business: 3.80 average.

School of Education: 3.80 average.

School of Engineering: 3.60 average; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.

School of Home Economics: 3.80 average.

School of Pharmacy: 3.75; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.

School of Veterinary Medicine: grades in the upper five per cent of the enrollment of each class.

Interdepartmental-Environmental Health: 3.65 average.

Resignation

A student who wishes to resign from all course work for a quarter should contact his dean. He withdraws without penalty of failure if he resigns no later than mid-quarter, a date specified in the University calendar.

After this date, the dean will obtain from the student's instructors his scholastic standing at the time of resignation, and report it to the Registrar. If the student is failing in over half his work, the number of hours reported as failing will be counted as credit hours attempted and will be included in academic eligibility calculations. Those hours reported as passing will be dropped and will not be counted in the grade-point computation. Furthermore, when a student's total hours attempted, multiplied by two, exceed grade points earned by more than 33 at the end of his last quarter in residence prior to resignation, his grades will be reviewed by his dean to determine whether he has a C average for the quarter in which he is withdrawing. If the student does not have a C average, he will be placed on academic suspension.

When a student through illness or physical disability is forced to resign after mid-quarter, and when this condition has been the main factor in causing scholastic deficiencies, discretionary power in waiving the scholastic penalty will rest with the student's dean. A student who is resigned for disciplinary reasons will retain the academic status he achieved immediately prior to the disciplinary action.

Academic Probation and Suspension of Undergraduates

Auburn University may place an undergraduate student on probation or suspension at any time if he flagrantly neglects his academic work or makes unsatisfactory progress toward graduation.

Academic eligibility requirements for continuation in residence are calculated on Auburn University course work. Academic probation is a scholastic warning, indicating that the student is in danger of being suspended. A student on probation can continue his enrollment without interruption. Academic suspension is a status that bars a student from continued enrollment at the University for a period of time.

A student will be placed on academic probation whenever his total number of hours attempted at Auburn, multiplied by two, exceed grade points earned by more than 18 except that no entering freshman will be placed on probation on the basis of his first quarter's work at the University.

A student may remove his probation status by reducing his grade point deficiency to 18 or fewer grade points.

An individual on academic probation will be placed on suspension when the number of hours he has attempted at the University, multiplied by two, exceed grade points earned by more than 33. However a student will not be suspended at the end of a quarter in which he earns a 2.0 (C) average, but will be continued on probation.

A student's first academic suspension will be for a period of two quarters, summer quarter being counted as any other quarter. He will be readmitted on

academic probation following the expiration of his first suspension. A student who incurs a second academic suspension is placed on indefinite suspension of at least four quarters before his application for readmission will be considered.

An academically suspended student who has incomplete or other deferred grades which could, when cleared, remove his suspension will be permitted to register conditionally for the next quarter. The suspension must be removed within two weeks of the beginning of the quarter; otherwise he will be resigned by the Registrar's Office.

No credit earned at another institution by a student on academic suspension from Auburn will be used in clearing a suspension or in meeting requirements for an Auburn University degree.

A student who resigns after mid-quarter may be subject to academic suspension. (See Resignation on page 34 for further information.)

SCHOOL OF PHARMACY. A student enrolled in the School of Pharmacy who is placed on academic suspension and who wishes to re-enter the School must, in addition to complying with other University readmission requirements, be approved for readmission by the Pharmacy Admissions Committee and, when applicable, by the University Admissions Committee.

SCHOOL OF VETERINARY MEDICINE. Any student who earns less than a 2.25 grade-point average for any quarter will be placed on academic probation. A student who fails to earn a 2.25 grade-point average for any two quarters in the same academic or calendar year may be dropped from the School of Veterinary Medicine for scholastic deficiency. In addition, a student who does not have an overall average of 2.25 for an academic year or who does not have a veterinary overall average of 2.25 for an academic year or who does not have a veterinary school cumulative average of 2.25 at the end of any academic year may be required to withdraw from the School of Veterinary Medicine.

A student who makes a grade of F on any course may be dropped from the School of Veterinary Medicine until such time as the course is offered again. Such student may be required to repeat certain other courses in the curriculum for the quarter in which a grade of F was earned.

Students who are dropped under the above provisions are eligible for admission to other curricula provided they meet the general scholastic requirements for continuance in the University. Scholastic penalties incurred during enrollment in the School of Veterinary Medicine will become part of the student's record.

Advanced Standing and Credit

Entering freshmen with superior preparation may qualify for advanced placement and/or credit not to exceed a total of 45 quarter hours in the following areas: biology, botany, chemistry, English, foreign language, history, mathematics, physics, and zoology.

Advanced placement or credit may be granted to entering freshmen who during their senior year in high school have made satisfactory scores on the College Board Advanced Placement Examinations. A student with special

competence in a specific area, as evidenced by secondary school records and scores on college ability or achievement tests, may qualify for advanced placement or credit by scoring well on a departmental proficiency examination.

The amount of credit allowable through advanced placement is determined by the dean and the department head concerned.

Students transferring to Auburn University who have received advanced standing credits from another institution may be awarded advanced standing credit for examinations, advanced placement and CLEP tests, military service courses or experiences, and proficiency tests insofar as the University's requirements for awarding such credits are met and the credits are applicable to the student's curriculum.

The prospective student is advised to write to the Registrar's Office at Auburn University requesting a brochure on the Advanced Standing Program. This brochure details the advanced placement and credit programs, the College Level Examination Program (CLEP), the General and Subject examinations of the CLEP, and the minimum scores required on the tests.

DEPARTMENTAL PROFICIENCY EXAMINATIONS may be given by a department upon application of the student. He may apply for such a test if he has taken college-level work in secondary school, in class or on a tutorial basis, or through private study. If he earns a satisfactory grade on the subject examination he will be eligible for placement in an advanced course and for credit in the subject.

MILITARY SERVICE CREDIT. Students who have served in the Armed Forces may receive credit for military courses completed at the college level, General Educational Development tests (except English), and correspondence courses completed through the Armed Forces Institute.

Those who have had military service and who do not meet the University's physical education requirement may receive credit as follows: for less than six months service, no credit; for six months to a year, one hour for Physical Education 101; for one year in service, two hours credit plus one hour's credit for swimming if the student passes the departmental swimming test.

Application for credit should be submitted to the Registrar. The student's dean must approve credits into the student's curriculum.

Correspondence and Extension Credit

A student may earn a maximum of 10 per cent of the total credits required for his baccalaureate degree by correspondence or extension; however only 18 hours of the final year's work may be earned thus. An individual having less than three quarters in residence prior to his last academic year may earn only 10 hours by correspondence or extension.

A student in residence may not enroll in a correspondence course if the course or a suitable substitute can be scheduled. The resident student may not exceed the maximum class hour load by adding a correspondence course.

The grade earned for correspondence credit will be entered on the student's record, but the grade points will not be included in the University grade average or continuation-in-residence requirements, nor will they exceed the credit hours earned equal to a C average.

Information on available courses may be obtained from the Correspondence Study Office, School of Education, Auburn University.

Degree Requirements

To earn the bachelor's degree a student must complete the subjects in his curriculum and must earn at least a C average on credits accepted for his degree program. An individual with credit from another institution must also have a C average on his Auburn course credits used in his curriculum toward graduation. Credits required for graduation range from 196 to 257 hours.

The student's dean clears subject requirements in the curriculum; the Registrar clears total hour, grade point, freshman English, and physical education requirements.

Forty-five hours must be earned in residence in order to receive a bachelor's degree. As a general rule the 45 hours must be taken in the final year and in the school or curriculum of graduation. The student's dean may waive the final year's residence, and may also allow course credit to be earned at another institution during the final year. However the 45 hours in residence at Auburn is a firm requirement.

To complete a second baccalaureate degree, an Auburn graduate must complete an additional 45 hours, at least 45 grade points, 36 weeks in residence, and satisfy course requirements in the curriculum. A graduate of another four-year institution who seeks a bachelor's degree at Auburn must complete the hours required in the final year of his curriculum and satisfy the requirements listed immediately above.

Seniors must clear deferred grades by the tenth day of the graduation quarter for courses to be used toward degree requirements. Correspondence courses must be completed by mid-quarter prior to graduation.

A graduation fee is payable to the Cashier's Office, at the beginning of the quarter of graduation. If a student is in default on any payment due the University, his diploma and academic record will not be issued until the matter is cleared.

Degrees are conferred at Commencement exercises each quarter. If a student does not plan to attend the exercises, he should make arrangements with his dean or the Registrar to receive his degree *in absentia*.

Graduation Honors

Students with a minimum overall grade average of 3.4 are graduated *With Honor*; a 3.6 *With High Honor*; and a 3.8 *With Highest Honor*. This distinction of high academic achievement is placed on the student's diploma and on his permanent record.

The grade average for graduation honors must be achieved on Auburn University course work. A student with transfer credits must have the required grade average on all course work attempted elsewhere as well as on Auburn University courses. Grades of S or U and noncredit courses are not used in the calculations.

Students earning a second baccalaureate degree must earn the minimum overall grade average required for honor distinction on the additional hours completed for the second degree as well as on all course work attempted.

At least 45 hours and three quarters in residence at Auburn University are required for graduation honors.

Student Academic Grievance Policy

The Student Academic Grievance policy, which appears in full in the student handbook, *Tiger Cub*, is designed to resolve academic grievances of students which result from actions of faculty or administrators.

Confidentiality of Student Records

The University recognizes that the maintenance of student information and educational records is necessary and vital to assist the student's education and development and to provide opportunities for University research and policy formulation. The University recognizes its obligation to exercise discretion in recording and disseminating information about students to insure that student's rights of privacy are maintained.

The University will furnish annual notification to students of their right to inspect and review their educational records; the right to request amendment of educational records considered by them to be inaccurate or misleading or that violate privacy or other rights; and of their right to a hearing should the University decline to amend such records. This annual notice will be published in the University's Bulletin.

The following guidelines have been developed to insure the privacy rights of students. For the purposes of this policy statement a student is defined as an individual who has been admitted and has been in attendance in a component unit of the University. Classification as a student in one component unit of the University (e.g., an undergraduate program) does not infer that the person has been accorded the rights outlined below in other component units (i.e., graduate school, professional schools, branch campus).

Student Access to Records

Students have the right to be provided a list of the types of educational records maintained by the University which are directly related to the student; the right to inspect and review the contents of these records; the right to obtain copies of these records; the right to a response from the University to reasonable requests for explanation and interpretation of these records; the right to an opportunity for a hearing to challenge the content of these records; and if any material or document in the educational record of a student includes information on more than one student, the right to inspect and review only the part of such material or document as relates to the student.

Students do not have access to: financial records of their parents; confidential letters and statements of recommendation which were placed in the educational record prior to January 1, 1975, provided such letters or statements were solicited or designated as confidential and are not used for purposes other than those for which they were specifically intended; confidential recommendations, if the student signed a waiver of the right of access, respecting admission, application for employment, and the receipt of an honor or honorary recognition.

Students do not have access to: instructional, supervisory, and administrative personnel records which are not accessible or revealed to any other individual except a substitute; Campus Security records which are maintained apart from educational records, which are used solely for law enforcement purposes, and which are not disclosed to individuals other than law enforcement officials of the same jurisdiction; employment records except when such employment requires that the person be a student; and the Alumni Office records.

Students do not have access to physical or mental health records created by a physician, psychiatrist, psychologist or other recognized professional acting in his or her capacity or to records created in connection with the treatment of the student under these conditions which are not disclosed to anyone other than individuals providing treatment. These records may be reviewed by a physician or appropriate professional of the student's choice.

Procedures for Access

The Registrar's Office has a complete list of educational records maintained by the University which students may obtain. Students should contact the appropriate office to inspect and review their records. An office may require that a University official be present when a student inspects and reviews his educational records. Any questions concerning a student's access to records should be directed to the Registrar.

Release of Directory Information

"Directory Information" may be released by the University without the student's written consent. Directory information consists of all items listed on the student's registration card, participation in recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, the most recent previous educational agency or institution attended, and other similar information.

A student may deny the release of directory information by requesting that the information not be released. This should be done at registration time. The student who is in attendance must notify the Registrar's Office in writing each quarter of enrollment to deny the release of this information. To deny the release of participation in recognized activities the student must notify the Dean of Student Affairs, Dean of Student Life, and the student's Academic Dean in writing. To deny the release of athletic information the student must notify the Director of Athletics in writing. To deny the release of directory information a student must give the above notification each quarter of registration. A former student, one who is not in attendance, must contact the appropriate offices above to deny the release of directory information.

Release of Educational Records

The University will release a student's educational record(s) upon the student's written request. The student must:

1. Specify the records to be disclosed.
2. Include the purpose or purposes of the disclosure.
3. State the party or parties and the address to whom the information is to be disclosed.

The student shall, upon request, receive a copy of the record that is to be disclosed. It is University policy to furnish single copies of a student's record at no charge except for the standard transcript fee, if applicable.

The University may release students' educational records to the following without prior written consent:

1. University officials who have a legitimate educational interest in the records. University officials are defined as teachers, administrative personnel and other employees except personnel of the security or law enforcement unit of Auburn University who in the performance of their normal duties require access to student records. If University officials are required in the performance of their duties to review the educational records of a student, this will be considered to be a legitimate educational interest.

2. Officials of another school in which the student intends to enroll upon request of the transfer school.

3. Government representatives of the Comptroller General of the United States, the Secretary of H.E.W., the U.S. Commissioner of Education, the Director of the National Institute of Education, the Assistant Secretary for Education, State educational authorities, and State officials to which such information is specifically required to be reported or disclosed by State law adopted prior to November 19, 1974.

4. Appropriate authorities in connection with financial aid with the understanding that only the necessary records will be released.

5. To organizations conducting studies for, or on behalf of, the University or its agencies for the purpose of developing, validating, or administering predictive tests, administering student aid programs, and improving instruction and student life provided that the studies will not permit the personal identification of students and their parents by individuals other than representatives of the organization and provided that the personally identifiable information furnished will be destroyed when no longer needed for the purposes for which the study was conducted.

6. To accrediting organizations to carry out their accrediting functions.

7. To parents of a dependent student as defined in section 152 of the Internal Revenue Code of 1954. University officials may release educational records to parents on the basis of a written certification from the parent that the student is a dependent as defined under the Code.

8. To comply with a judicial order or lawfully issued subpoena with the understanding that the student will be notified in advance insofar as possible.

9. To appropriate parties to protect the health and safety of the student or other individuals in emergencies with the understanding that only information essential to the emergency situation will be released, that information will only be released to a party who would be in a position to deal with the emergency, and that the student will be notified insofar as possible of the information released, the purpose for the release, and to whom the information was released.

No personal information on a student will be released without a statement from the University to the party receiving the information that no third party is to have access to such information without the written consent of the student.

Each office with educational records will maintain a record of each request and disclosure of personally identifiable information from the educational records of a student except for information requested in writing by the student, information released to the student or the student's parents, directory information, and information released to University officials and teachers who have a legitimate educational interest in the records. The student may inspect the record of requests, disclosures and the legitimate interests of parties requesting or obtaining information in the appropriate University office.

Amending Educational Records

A student may request that any information contained in his educational records which the student considers to be inaccurate, misleading, or in violation of his privacy or other rights be amended or deleted from the records. (A grade or other academic scores may not be amended, except that the accuracy of recording the information may be challenged.)

A student who requests that information in his records be amended should first direct his request to the official with primary responsibility for the information on the record. If the matter is not resolved to the student's satisfaction, the student should direct his request to the official's dean or division head. If the matter is not resolved to the student's satisfaction, he may request a formal hearing.

Right to a Formal Hearing and Procedures for Decision

A student may request a formal hearing to challenge information contained in his educational records. The hearing will be held in a reasonable time (not to exceed 45 days) and in a reasonable place. The student may be assisted or represented by a person of his choice, including an attorney, at the expense of the student, and shall be afforded a full and fair opportunity to present evidence relevant to the issue (s).

The student or his representative should request the hearing in writing and should specifically identify the information he seeks to have amended. The request should be directed to the Assistant to the President.

The Assistant to the President will conduct the hearing and render a decision within a reasonable period of time after the conclusion of the hearing and the decision shall be based solely upon the evidence presented at the hearing. The student shall be notified in writing of the reason(s) for the decision and a summary of the evidence.

If the decision is that the information in the student's educational records is inaccurate, misleading or in violation of his rights and privacy, the statement(s) will be corrected or expunged from the student's records.

If the decision is that the information is not inaccurate, misleading, or in violation of the privacy or other rights of the student and that the information or parts thereof is to remain in the student's educational records, the student

shall be notified and given the right to enter a statement in his records setting forth any reason for disagreeing with the decision of the Assistant to the President. This statement shall be maintained in the records as long as the record or contested portion thereof is maintained, and if the contested educational record or contested portion thereof is disclosed by Auburn University to any party, the student's explanation shall also be disclosed to that party.

The Secretary of HEW has established a review board to receive complaints regarding violation of students' rights. Students wishing to file a complaint directly to the review board should write to the Family Educational Rights and Privacy Act Office, Department of Health, Education, and Welfare, 330 Independence Avenue, SW, Washington, D.C. 20201. Detailed procedures for this complaint procedure are listed under section 99.63 of the regulations issued by the Secretary and will be furnished upon request by the Registrar, Auburn University.

This policy is adopted pursuant to the Family Educational Rights and Privacy Act of 1974, as amended (20U.S.C. §1232g), and is not intended to impose any restrictions or grant any rights not specifically required by this Act.

Student Affairs

Student Government Association

Upon enrollment at Auburn University, each student becomes a member of the Student Government Association, the official organization of the student body. All students are urged to participate in the Association or SGA, as it is called, and to become involved in the political life of the campus.

SGA is organized into executive, legislative, and judicial branches. Each of the ten Schools of the University is represented in the Student Senate. One of that body's powers is the selection of a non-voting student representative to attend meetings of Auburn University's Board of Trustees. The judiciary is made up of a presiding justice and six associates. Officers and senators are chosen in the Spring Quarter by general election. The Student Government Constitution and Laws, published in the *Tiger Cub*, detail the functioning of student government.

Student Communications

The following media, supported by Student Activity fees, are subject to supervision by the Board of Student Communications:

The Auburn Circle, a quarterly literary magazine

The Glomerata, the yearbook issued each spring

The Auburn Plainsman, the weekly student newspaper

The Tiger Cub, annual student handbook

WEGL-FM, the student operated campus radio station

Other publications include the *Auburn Design*, a booklet published yearly for and by students in Industrial Design; the *Auburn Veterinarian*, a quarterly published by and for students in Veterinary Medicine; and the *Auburn Pharmacist*, issued once a quarter by the School of Pharmacy. The latter three do not derive support from the Student Activity fee.

The University Chapel

The University Chapel, located on the corner of South College Street and Thach Avenue, is open on weekdays for students, faculty, and staff. It is used for prayer and meditation and can be reserved for religious and certain other University events at nominal or no cost, in the Office of Student Affairs. The use of the organ is supervised by the Department of Music.

The Foy Union

The Foy Union serves as a focal point for co-curricular student activities as well as other campus programs. The Union houses the Plainsman, Glomerata, Auburn Circle, Alpha Phi Omega Bookstore, SGA, IFC, Panhellenic Council, University Program Council, Alumni Association, War Eagle Cafeteria, a recreation room, a typing room, a ceramics room, woodworking hobby shop,

and an art gallery. It also provides lockers for commuters, a 24-hour banking service, several lounge areas and an assortment of meeting and banquet rooms. In addition a University-wide information center and calendar of events is maintained.

University Program Council

The University Program Council serves as a clearing house for campus programs as well as areas providing directly a range of programs and entertainment through the following committees: 1) Major entertainment, 2) Horizons, 3) Publicity, 4) Special Events, 5) Fine Arts, 6) Recreation, and 7) Visual Arts. In addition this experience in planning and executing programs offers students the opportunity to enhance their personal growth and development.

Music, Theatre, and Lectures

Classical concerts, touring play productions, lectures by political figures, news commentators, specialists and prominent scholars, traveling and local shows at the art galleries, opera, ballet, and films are among the special events of the year at the University. Many of these activities are free.

The University Concert Choir, the Choral Union, University Singers, the Marching and Concert Bands, the University Orchestra and the Opera Workshop offer opportunities for those who want to perform in Musical groups.

Eight or nine productions each year are offered by the Auburn University Theatre. Students are welcome to audition for any production but priority in casting is given to theatre majors and minors.

Various dance events throughout the year are sponsored by the University Dance Council, which presents a dance concert in the spring and goes on tour in the fall and spring. Anyone interested in promoting dance is welcome to join. The Dance Studios are in Memorial Coliseum.

The Auburn Studio of the Alabama Public Television Network produces programs which are seen throughout the state on the Alabama Educational Television network. WEGL-FM is the campus radio station, operated by students.

ORGANIZATIONS

National Honor Societies

The following members of the Association of College Honor Societies have established chapters at Auburn:

Alpha Epsilon Delta (Pre-Medicine)
Alpha Kappa Delta (Sociology)
Alpha Lambda Delta (Freshman Scholarship)
Alpha Pi Mu (Industrial Engineering)
Chi Epsilon (Civil Engineering)
Delta Sigma Rho-Tau Kappa Alpha (Forensics)
Eta Kappa Nu (Electrical Engineering)
Kappa Delta Pi (Education)
Mortar Board (Student Leadership)
Omega Chi Epsilon (Chemical Engineering)
Omicron Delta Kappa (National Leadership)
Omicron Nu (Home Economics)
Phi Alpha Theta (History)

Phi Eta Sigma (Freshman Scholarship)
Phi Kappa Phi (Senior Scholarship)
Pi Delta Phi (French)
Pi Sigma Alpha (Political Science)
Pi Tau Sigma (Mechanical-Aerospace Engineering)
Psi Chi (Psychology)
Rho Chi (Pharmacy)
Sigma Delta Pi (Spanish)
Sigma Gamma Tau (Aerospace Engineering)
Sigma Pi Sigma (Physics)
Sigma Tau Delta (English)
Tau Beta Pi (Engineering)
Xi Sigma Pi (Forestry)

National Recognition Societies

The following national societies have chapters established at Auburn:

Alpha Epsilon Rho (Broadcasting)
Alpha Eta Rho (Aviation)
Alpha Phi Omega (Service)
Alpha Psi Omega (Theater)
Alpha Zeta (Agriculture)
Angel Flight (Air Force ROTC Auxiliary)
Arnold Air Society (Air Force ROTC)
Beta Alpha Psi (Accounting)
Beta Gamma Sigma (Business)
Block and Bridle (Animal Husbandry)
Capers (Army ROTC Auxiliary)
Delta Omicron (Music)
Delta Sigma Pi (Commerce and Business Administration)
Disc and Diamonds (Army ROTC)
Gamma Sigma Delta (Agriculture)
Gamma Sigma Sigma (Service)
Kappa Epsilon (Pharmacy)
Kappa Psi (Pharmacy)
Lambda Sigma (Sophomore Leadership)
Lambda Tau (Medical Technology)

Omicron Delta Epsilon (Economics)
Omicron Kappa Pi (Architecture)
Pershing Rifles (Military)
Phi Chi Theta (Business Administration and Economics)
Phi Delta Kappa (Education)
Phi Delta Chi (Pharmacy)
Phi Lambda Upsilon (Chemistry)
Phi Mu Alpha (Music)
Phi Psi (Textiles)
Phi Zeta (Veterinary Medicine)
Pi Alpha Xi (Floriculture)
Pi Mu Epsilon (Mathematics)
Scabbard and Blade (Military)
Semper Fidelis (Marine Corps ROTC)
Sigma Delta Chi (Journalism)
Sigma Gamma Epsilon (Earth Sciences)
Sigma Lambda Chi (Building Construction)
Steerage (Navy ROTC)

Social Fraternities

Alpha Epsilon Pi
Alpha Gamma Rho
Alpha Psi (professional)
Alpha Tau Omega
Beta Theta Pi
Chi Phi
Delta Chi
Delta Sigma Phi
Delta Tau Delta
FarmHouse
Kappa Alpha Order
Kappa Alpha Psi
Kappa Sigma
Lambda Chi Alpha
Omega Psi Phi

Omega Tau Sigma (professional)
Phi Delta Theta
Phi Gamma Delta
Phi Kappa Psi
Pi Kappa Tau
Pi Kappa Alpha
Pi Kappa Phi
Sigma Alpha Epsilon
Sigma Chi
Sigma Nu
Sigma Phi Epsilon
Sigma Pi
Tau Kappa Epsilon
Theta Chi
Theta Xi

The Interfraternity Council coordinates the relationships between the member fraternities.

Sororities

Alpha Chi Omega
Alpha Delta Pi
Alpha Gamma Delta
Alpha Kappa Alpha
Alpha Omicron Pi
Chi Omega
Delta Delta Delta
Delta Gamma
Delta Sigma Theta

Delta Zeta
Gamma Phi Beta
Kappa Alpha Theta
Kappa Delta
Kappa Kappa Gamma
Phi Mu
Pi Beta Phi
Zeta Tau Alpha

The Panhellenic Council coordinates the activities of its member groups.

Leadership and service organizations, sports clubs, religious organizations, and departmental and professional groups are listed in the student handbook, *Tiger Cub*.

Intramural Sports and Recreational Services

The University offers to its students a well rounded program of intramural athletics and provides a variety of facilities for recreation. Healthful sports, good sportsmanship, and friendly competition are stressed, and all students are urged to participate in recreational activities.

Regular tournaments are offered in seasonal team and individual sports. The intramural program operates services in the Student Activities Building

where students may check out recreation equipment. For additional information, consult the Recreational and Intramural Sports handbook which can be obtained at the Intramural Office, 2074 Memorial Coliseum.

Discipline

Auburn University establishes and enforces only those rules and regulations for conduct as are needed to maintain the well-being of the individual student and the University community. The student, in registering at the University, agrees to conform with its regulations. He is subject to disciplinary action if he violates any section of the Code of Student Discipline, which appears in full in the student handbook, *Tiger Cub*. Enrollment in no way exempts any student from penalty in case of conviction by public authorities for commission of an illegal act.

Student Life

Housing

Residence Halls

Auburn University provides 26 residence halls with capacity ranging from 42 to 360 students. These halls provide a variety of living accommodations from suites to private rooms. Each hall is staffed with a Head Resident or a Graduate Resident Adviser who serves as a counselor to the students. Residence halls with the exception of two, are clustered in three areas. The Magnolia Complex consists of:

*Bullard Hall
Magnolia Hall
Noble Hall*

The Quadrangle Complex consists of:

- | | |
|----------------------------------|------------------------------------|
| I <i>Elizabeth Harper Hall</i> | VII <i>Mary Lane Hall</i> |
| II <i>Kate Conway Broun Hall</i> | VIII <i>Ella Lupton Hall</i> |
| III <i>Willie Little Hall</i> | IX <i>Helen Keller Hall</i> |
| IV <i>Kate Teague Hall</i> | X <i>Marie Bankhead Owen Hall</i> |
| V <i>Letitia Dowdell Hall</i> | XII <i>Dana King Gatchell Hall</i> |
| VI <i>Allie Glenn Hall</i> | |

The Hill Complex consists of:

- | | |
|----------------------------------|------------------------------------|
| A <i>Mollie Hollifield Hall</i> | F <i>Dixie Bibb Graves Hall</i> |
| B <i>Annie Smith Duncan Hall</i> | G <i>Camille Early Dowell Hall</i> |
| C <i>Marguerite Toomer Hall</i> | H <i>Stella White Knapp Hall</i> |
| D <i>Zoe Dobbs Hall</i> | J <i>Mary Boyd Hall</i> |
| E <i>Berta Dunn Hall</i> | K <i>Sara Sasnett Hall</i> |

Auburn Hall is located on E. Thach Avenue and Alumni Hall is located on S. College Street. All halls are conveniently located and within reasonable walking distance of classes.

These halls include the following types of living accommodations:

TYPE I

Suites consisting of two double rooms with connecting bath; private telephone; air-conditioned; rent, \$180 per quarter.

TYPE II

Suites consisting of two double rooms with connecting bath, private telephone; non-air-conditioned; rent, \$160 per quarter.

TYPE III

Double rooms with community baths on each floor; air-conditioned with private telephone; rent, \$170 per quarter.

TYPE IV

Double rooms with community baths on each floor; non-air-conditioned with private telephone; rent, \$145 per quarter.

TYPE V

Double rooms with community baths on each floor; non-air-conditioned without private telephone; rent, \$115 per quarter.

TYPE VII

Private rooms with community baths on each floor; non-air-conditioned without private telephone; rent, \$155 quarter.

TYPE VI

Private rooms with community baths on each floor; air-conditioned with private telephone; rent, \$215 per quarter.

Students' rooms are furnished with single beds, study desks, mirrors, chests of drawers, chairs, book shelves, and closets. Residents may bring other furnishings including study lamps, bedspreads and linens, curtains or drapes, rugs or carpet, extra book shelves, radios, stereos, television sets, plants, posters, and small refrigerators. Students are encouraged to bring room fans for non-air-conditioned halls, but room air-conditioners are not allowed.

Especially equipped facilities for handicapped students are provided in four campus residence halls. These facilities include wheelchairs ramps and especially designed bathrooms.

Requests for room reservations should be addressed to the Dean of Student Life, Social Center. Details are covered in the Housing Agreement, which the applicant will receive, on request. A completed Housing Application and Housing Agreement, with a \$50.00 check payable to Auburn University for room reservation deposit, should be returned promptly by the applicant to the Housing Office, Burton Hall, Auburn University.

The deposit is held to cover possible loss or damage to property, and does not apply to room rent. The Housing Agreement outlines conditions under which refunds may be made. The Housing Agreement is a contract for the academic year for three quarters (Fall, Winter, and Spring), or for the balance of the academic year if the student enters in Winter or Spring Quarters. The Summer Quarter is regarded as a separate contract period.

A ROOM RESERVATION IS NOT VALID UNLESS THE APPLICANT HAS BEEN ADMITTED TO AUBURN UNIVERSITY.

Because of the large number of requests for rooms for the Fall Quarter, it is necessary to assign three students to some of the rooms in the dormitories which have suites. Only one room in a suite is tripled. Each student living in a triple for the Fall Quarter receives a refund of a portion of the room rent.

Room rent is due and payable in full prior to the first day of classes. A late fee of \$5.00 will be charged on payments made during the first five days of classes. A late fee of \$10.00 will be charged on payments made after the fifth day of classes; however, when deemed necessary, arrangements may be made with the appropriate Housing Cashier for payment of one-half of the room rent at the beginning of the quarter and the other one-half by mid-quarter. (See the section on Fees and Charges.)

Married Student Housing

Caroline Draughon Village consists of apartments for married students which are grouped in two-story brick buildings of 8, 16, and 20 units. One- and two-bedroom apartments are available. Each apartment has a separate outside entrance. The apartments feature all-electric kitchens, furnished living and dining rooms and bedroom, spacious closets, ample cabinets and baths with shower-tub combinations. A monthly rent of \$95.00 to \$140.00 includes heat, water, solid waste disposal, sewerage, garbage pickup, and cable television. Electricity and telephone charges are the responsibility of the resident.

To apply for housing or for additional information, write to Manager, Caroline Draughon Village, 901 W. Thach Ave., Auburn, AL 36830.

Off-Campus Housing

Privately-owned dormitories, fraternities, apartments, houses, and mobile homes in the Auburn community also provide living quarters. The University maintains a current file of available accommodations in the Off-Campus Housing Office, Social Center.

The University neither inspects nor approves off-campus housing. The facilities must, however, conform to federal regulations and to the local code of health and safety regulations. The same general rules of student conduct apply in housing both on and off campus.

Student Programs

Student Development Services

Counselors provide confidential assistance to students with curriculum selection, career exploration, personal concerns, learning skills development, and legal matters. Also included are advisory services to married, international, minority and veteran students. A Study Partners program is offered quarterly. These services are located in Mell Hall and are available to current and prospective students.

Student Health Center

The mission of the Student Health Service is to provide initial diagnostic service and treatment for illnesses and injuries occurring while the student is enrolled on the Auburn campus and includes short term hospitalization for minor illnesses.

The Health Service supplements the student's own medical program rather than providing comprehensive medical care; routine examinations and specialty services are not provided, and it is strongly recommended that individual health insurance be carried to cover major medical or surgical services.

HOURS OF OPERATION

DURING QUARTER SESSION

The out-patient clinic is open from 8:00 a.m. to 4:30 p.m., each day, Monday through Friday, and 9:00 a.m. to 12:00 noon on Saturdays. Emergency treatment is available during all other hours, seven days per week, with a staff physician on call.

HOLIDAYS

The Health Center is closed from 4:30 p.m. on the day preceding an official University holiday until 7:00 a.m. on the day following the holiday.

BETWEEN QUARTERS

Starting at 8:00 a.m. on the day after graduation until the day before classes start the next quarter, only emergency out-patient treatment will be provided. The hours of operation will be 8:00 a.m. to 4:30 p.m., Monday through Friday. This service is available to those students participating in University-sponsored functions. For additional information, consult the *Tiger Cub*.

Student Insurance

The Student Government Association sponsors two Accident and Sickness Insurance Plans, which are available to all registered undergraduate and graduate students. The plans provide maximum coverage at minimum cost. Additional information on insurance is available in the Student Affairs Office, 304 Martin Hall.

Food Service

Auburn University Food Services is a non-profit organization supported entirely by food sales in the food service operations located on campus. All services offered to students are strictly on a voluntary basis and are available to students living both on and off campus. Food Services offers a variety of meal options and services to meet students' needs better.

Meal Contract Plan

The meal contract is non-inflationary, binding and non-transferable for the quarter it is in effect. There are three options available—the Seven-Day Plan, Monday through Sunday noon (20 meals); the Five-Day Plan, Monday through Friday noon (14 meals); and the Quarter 99 Plan, Monday through Sunday noon (any 99 meals per quarter). Meal Contracts are not in effect on official university holidays.

Seven-Day Plan—\$392 plus tax

\$1.85 per meal average

Five-Day Plan—\$325 plus tax

\$2.18 per meal average

Quarter 99 Plan—\$294 plus tax

\$2.97 per meal average

The Seven-Day Plan is the most economical. Even if several meals are missed, the average price per meal will still be less than other plans as well as less than eating a la carte.

Three cafeterias—Magnolia, Terrell (north end), and Alumni—serve students who are on a meal contract plan. Free flow among these cafeterias provides convenience to the student.

The Chef's Club

The Chef's Club is a food charge plan that may be used in all nine food operations located on campus. Students can receive credit approval by furnishing two credit references or by furnishing a parent's notarized signature as co-signer. There is an annual membership fee for the Chef's Club.

The minimum amount that can be charged at one time is thirty cents; the maximum amount that can be charged at one time is nine dollars. Use of this card is restricted to the holder. Students violating the privileges of the card will be subject to University discipline.

Chef's Club members are billed on a monthly basis and the total amount must be paid within ten days after the mailing. All Chef's Club bills must be paid before a student can register for the next quarter. Chef's Club cards are issued during the year and valid through summer quarter. In addition, there is a five dollar charge for all lost cards.

Cash

Cash is accepted at all food operations located on campus. However, after thorough investigation the student will find that a Meal Contract Plan will definitely save money on the average cost per meal.

Additional information on Meal Contract Plans, and The Chef's Club are available through the offices of both Food Services and Housing.

Related Programs and Activities

Cooperative Education Program

The Cooperative Education program provides opportunities for students to alternate quarters of academic study with quarters of experience in industry, education, business, and government agencies.

Coordination of study and work combines theory and practice. As a consequence students find increased meaning in and motivation for their studies. This experience helps to develop a sense of responsibility, judgment, and maturity. Students also benefit financially, since they are paid for their work.

In all four-year curricula, the Cooperative Education Program is a five-year plan. A student must complete at least two quarters of the freshman year with an above average scholastic record before "being placed" with an employer. Cooperative Education is offered in all curricula of the Schools of Agriculture, Architecture and Fine Arts, Arts and Sciences, Business, Education, Engineering, and Home Economics.

Additional information may be secured from the Director, Cooperative Education, Auburn University.

Correspondence Study

The Correspondence Study program provides undergraduate instruction for persons unable to attend college on a regular basis. Correspondence courses parallel those given in the University, carry college credit, and are taught by faculty members.

The student, upon registration, will receive a course outline and instructions. He will be expected to do textbook readings, written preparations, and possible supplemental work. A final examination is given upon completion of unit work. Any person is eligible for enrollment, although such enrollment is not equivalent to admission to the University.

Although graduate credit cannot be earned by correspondence, certain undergraduate deficiencies may be cleared.

Fees for correspondence courses are listed under Fees and Charges. See also Off-Campus Credit in the section on Academic Regulations. Application forms and additional information are available from the Director, Auburn University Correspondence Study Program.

Special Clinics

The Speech and Hearing Clinic of the Department of Speech Communication, primarily a teaching facility, provides service for students with speech or hearing problems.

Bookstores

The University Bookstore, located in Haley Center, offers a full line of textbooks and other instructional materials. Alpha Phi Omega service fraternity sponsors a nonprofit bookstore in the Foy Union Building where students may purchase and sell textbooks. There are also commercial book outlets in the city of Auburn.

Vehicle Registration

Registration of vehicles, including bicycles, is a part of the enrollment procedure for all students at the beginning of Fall Quarter.

Students who bring unregistered vehicles, including bicycles, to campus after the Fall enrollment period must register them at once at the University Security Office. Failure to register a vehicle, to use the proper decal, and to park in the proper zone will subject the operator to certain penalties.

Freshmen may bring autos to Auburn, but cannot operate them on campus during certain hours unless commuting. Because of the parking situation on campus and in Auburn, students are not encouraged to bring automobiles unless absolutely required for commuting.

The regulations stated above are subject to modification by the beginning of the Fall Quarter. Specific and current information on parking areas, regulations, controls, commuting, violations, and penalties may be found in "Parking and Traffic Regulations" and the "University Bicycle Code," available at the University Security Office.

School of Agriculture

R. DENNIS ROUSE, *Dean*

CHARLES F. SIMMONS, *Associate Dean*

STANLEY P. WILSON, *Assistant Dean*

E. V. SMITH, *Dean Emeritus*

THE SCHOOL OF AGRICULTURE prepares students for careers in agriculture and related professions. Courses provide a broad foundation in the basic sciences, a general knowledge of the applied sciences, and a reasonable number of cultural subjects. Most of the basic science courses are given in the freshman and sophomore years and serve as a basis for a better understanding of the applied or more practical subjects which are usually taken in the junior and senior years.

A curriculum is offered in Agricultural Science with majors in Agronomy and Soils, Animal and Dairy Sciences, Poultry Science, Horticulture, and Agricultural Journalism. Other curricula are offered in Agricultural Business and Economics; Agricultural Engineering; Biological Sciences, with majors in Botany, Fisheries Management, Wildlife Management, Entomology, Zoology, Microbiology, and Marine Biology; Food Science; Forest Management; Ornamental Horticulture; Plant Protection; and Wood Technology. If a student is permitted to major in a field where the courses are not prescribed in the catalog he should consult with the dean.

The School of Agriculture also furnishes the subject matter training in Agriculture for the curriculum for training teachers of Vocational Agriculture.

Transfer credit will not normally be allowed for any course passed with a grade lower than C at any other college or university.

Credit toward a degree in any curriculum in the School of Agriculture will not be allowed for a mathematics course at a level lower than that specified in the curriculum. However, students who are not prepared to take the prescribed courses may take lower level courses without degree credit.

Only on the basis of validating examinations by the student will transfer credit in agriculture subjects be accepted from colleges where instruction in these subjects is usually done by faculty members who do not hold graduate degrees in the specific area of their instructional responsibilities. Arrangements for validating examinations must be made with the Dean of Agriculture in the first quarter of the student's enrollment in the School of Agriculture at Auburn and the examinations must be completed before the middle of the second quarter. Transfer credit in lieu of courses that are considered to be upper division courses in substance at Auburn University will not be accepted from two-year colleges.

Dual Degree Program Between the Schools of Agriculture and Engineering

This program gives students the opportunity to receive two baccalaureate degrees—one in Agriculture and one in Engineering. Although the program was developed primarily for students desiring a combination of a Biological Sciences program with an Engineering program, it does not preclude the consideration of other Agriculture-Engineering combinations.

In general, the student will be enrolled in the School of Agriculture for approximately three years and in the School of Engineering for approximately two years. During the first three years, the student should take those mathematics, physics, and chemistry courses necessary to allow him or her to transfer to the School of engineering. Additionally, before transferring to the School of Engineering, the student should have completed approximately three-fourths of the total hours required by the School of Agriculture for the awarding of that degree.

To become a dual-degree candidate under this program, the student must have a grade point average which indicates the likelihood of satisfactory completion of Engineering School degree requirements and a recommendation from the Dean of the School of Agriculture. Recommendation should be sought one quarter before time of expected transfer to the School of Engineering.

It is also possible for very highly qualified students to transfer to the School of Engineering following the junior year with the intent of seeking a Master's Degree rather than a Bachelor's Degree in one of the Engineering disciplines. Consult the Engineering Dean's Office concerning this option.

Agricultural Science (AG)

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	CH 104	Fund. Chem. & Lab.	5
MH 160	Pre-Cal. w. Trig.	5	CH 103	Fund. Chem. & Lab.	5	MH 161	An. Geom. & Cal.	5
EH 101	English Composition	3	EH 102	English Composition	3	EH 103	English Composition	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1
			SOPHOMORE YEAR					
ADS 200	Intr. An. & Dairy Sciences	5	AEC 202	Agr. Economics I	5	ADS 204	An. Biochem. & Nut.	5
BI 103	Animal Biology	5	AY 301	Prin. Grain Prod.	5	HF 201	Orchard Mgt.	5
PS 200	Fnds. of Physics	5	CH 207	Org. Chem. & Lab.	5		Elective	5
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1
PE 101	Fnds. of Phys. Ed.	1	PE 102	Begin. Swim	1	PE	From Group II	1
			JUNIOR YEAR					
PH 201	Gen. Poultry	5	BY 306	Fund. Plant Phys.	5	AY 304	General Soils	5
SC 202	App. Sp. Comm.	3	BY 309	Gen. Plant Path.	5	HF 308	Veg. Crops	5
	Ag. Eng. Elective*	5	JM 315	Technical Journalism	3		Ag. Eng. Elective*	5
	Elective	5		Elective	5		Elective	3
			SENIOR YEAR					
AY 401	Prin. Forage Prod.	5	AEC 301	Ag. Marketing	5	ADS	Elective**	5
FY 313	Farm Forestry	5	AY 404	Fiber & Oil Crops	5	AEC 501	Farm Management	5
	Electives	8		Electives	8	ZY 502	Econ. Entomology	5
							Elective	3

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*To be selected from AN 350, 351, 352, 353, and 354.

**May be selected from ADS 501, 502 or 504.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Agronomy And Soils (AY)

Courses are designed to prepare Agronomy graduates for several major areas of endeavor: (1) the chemical industry, producers of fertilizers, herbicides, and other agricultural chemicals; (2) farm-advisory agencies such as soil testing

laboratories and other private consultants; (3) public farm-advisory agencies such as the Agricultural Extension Service or the Soil Conservation Service; (4) research agencies of corporations, U.S. Department of Agriculture, colleges and universities, and State Agricultural Experiment Stations; (5) turfgrass industry; (6) farming.

FRESHMAN YEAR		
First Quarter		
CH 103	Gen. Chem. & Lab.....	5
MH 160	Pre-Cal. w. Trng.....	5
EH 101	English Comp.....	3
HY 101	World History.....	3
	Basic ROTC†.....	1
Second Quarter		
BI 101	Prin. of Biology.....	5
CH 104	Gen. Chem. & Lab.....	5
EH 102	English Comp.....	3
HY 102	World History.....	3
	Basic ROTC†.....	1
Third Quarter		
BI 102	Plant Biology.....	5
MH 161	An. Geom. & Cal.....	5
EH 103	English Comp.....	3
HY 103	World History.....	3
	Basic ROTC†.....	1
SOPHOMORE YEAR		
First Quarter		
ADS 204	An. Biochem. & Nutrition.....	5
BI 103	Animal Biol.....	5
CH 207	Organic Chem. & Lab.....	5
	Basic ROTC†.....	1
PE 101	Fund. of Phys. Ed.....	1
Second Quarter		
AY 301	Prin. of Grain Prod.....	5
BY 300	General Microbiol.....	5
GL 110	Physical Geology.....	5
	Basic ROTC†.....	1
PE 102	Begin. Swim.....	1
Third Quarter		
AEC 202	Ag. Econ. I.....	5
AY 304	Gen. Soils.....	5
PS 200	Fnds. of Physics.....	5
	Basic ROTC†.....	1
PE 159	Golf.....	1

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Crops and Soils Option

JUNIOR YEAR		
First Quarter		
AY 312	Prin. of Weed Sci.....	5
AY 350	Soil & Water Tech.....	5
BY 306	Fund. Plant Phys.....	5
SC 202	App. Sp. Comm.....	3
Second Quarter		
ADS 200	Intr. An. & Dairy Sc.....	5
HF 308	Vegetable Crops.....	5
AY 506	Fertilizers & Soil Test.....	5
	Elective.....	3
Third Quarter		
AY 515	Soil Morph.....	5
ZY 300	Genetics.....	5
JM 315	Technical Journ.....	3
	Elective.....	5
SENIOR YEAR		
First Quarter		
AEC 501	Farm Mgt.....	5
AY 401	Prin. of Forage Prod.....	5
FY 313	Farm Forestry.....	5
	Elective.....	3
Second Quarter		
AY 404	Fiber & Oil Crops.....	5
BY 309	Plant Pathology.....	5
	Elective.....	8
Third Quarter		
AY 502	Soil Fertility.....	5
ZY 502	Econ. Ent.....	5
	Elective.....	8

The student must take at least 5 hours from AN 351, 352, 353, and 354; and 9 hours of electives must come from Humanities and Fine Arts, and Social Sciences.

TOTAL—210 QUARTER HOURS

Turf Management Option

JUNIOR YEAR		
First Quarter		
AN 350	Soil & Water Tech.....	5
AY 315	Turfgrass Mgt.....	5
BY 306	Fund. Plant Phys.....	5
SC 202	App. Sp. Comm.....	3
Second Quarter		
HF 221	Landscape Gardn.....	5
AY 506	Fertilizers & Soil Test.....	5
	Elective.....	8
Third Quarter		
AY 515	Soil Morph.....	5
ZY 300	Genetics.....	5
JM 315	Technical Journ.....	3
	Elective.....	5
SENIOR YEAR		
First Quarter		
AY 401	Prin. Forage Prod.....	5
AY 312	Prin. Weed Sci.....	5
AY 516	Adv. Turf Mgt.....	5
	Elective.....	3
Second Quarter		
ACF 215	Gen. & Cost Acct.....	5
BY 309	Plant Pathology.....	5
HF 521	Care & Maint. of Ornamentals.....	5
	Elective.....	3
Third Quarter		
AY 502	Soil Fertility.....	5
AY 499	Special Prob.....	5
ZY 502	Econ. Ent.....	5
	Elective.....	3

The student must take at least 5 hours from AN 351, 352, 353, and 354; and 9 hours of electives must come from Humanities and Fine Arts, and Social Sciences.

TOTAL—210 QUARTER HOURS

Animal And Dairy Sciences (ADS)

This curriculum is designed to qualify the graduate in the basic and applied sciences in preparation for a future in the management of animal production units; for work with governmental and private agricultural agencies; for

entering the field of processing dairy products and meats; for pursuit of scientific investigations in the field of animal agriculture; and for teaching.

Students may select a terminal degree option and prepare themselves to become (1) owners or managers of livestock farms; (2) feedlot managers; (3) livestock buyers and graders; (4) agricultural communication workers; and (5) representatives for animal agri-business.

Students are encouraged to take the graduate preparatory option if they anticipate the possibility of advanced study beyond the B. S. degree. Advanced study is necessary in preparing for most positions in teaching, extension education and research in universities and animal allied industries.

FRESHMAN YEAR					
First Quarter		Second Quarter	Third Quarter		
CH 103	Fund. of Chem. & Lab. 5	CH 104	Fund. of Chem. & Lab. 5	ADS 200	Intr. An. & Dairy Sci. 5
MH 160	Pre-Cal. w. Trig. 5	MH 161	An. Geom. & Cal. 5		Elective 5
ADS 101	Man's Food 3	EH 102	English Comp. 3	EH 103	English Comp. 3
EH 101	English Comp. 3	HY 101	World History 3	HY 102	World History 3
PE 101	Fnds. of Phys. Ed. 1	PE 102	Begin. Swim. 1	PE	From Group II 1
	Basic ROTC† 1		Basic ROTC† 1		Basic ROTC† 1
SOPHOMORE YEAR					
BI 101	Prin. of Biology 5	ADS 204	Animal Biochem. & Nutr. 5	BI 102	Plant Biology 5
CH 207	Organic Chem. & Lab. 5	BI 103	Animal Biology 5	ADS 302	Feeds & Feeding 4
ADS 210	Intr. Meat Sci. & Technol. 4	PG 212	Psychology 3	PS 200	Fnds. of Physics 5
HY 103	World History 3		Elective 3	ADS 309	Live An. Eval. 3
	Basic ROTC † 1		Basic ROTC † 1		Basic ROTC † 1
JUNIOR YEAR					
BY 300	Microbiol. 5	ADS 506	Animal Reprod. 5	ADS 503	Animal Breeding 5
ZY 316	Physiol. of Dom. Anm. 5	ADS 508	Adv. An. Nutr. 5	AEC 202	Ag. Econ. I 5
ZY 300	Genetics 5	AY 304	General Soils 5	SC 211	Fund. Sp. Comm. 5
	Elective 3	JM 315	Technical Journalism or		Elective 3
		EH 304	Technical Writing 3		
SENIOR YEAR					
AEC 501	Farm Mgt. 5	ADS 420	Seminar 1	ADS 422	Animal Disease Control 5
ZY 502	Economic Ento. 5		Electives* 16		Elective* 11
	Electives* 6				

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*A minimum of 10 hours must be completed from among ADS 501, ADS 502 or ADS 504, and 5 hours from AY 301 or AY 401 and 5 hours from among AN 350, 351, 352, 352 or 354. Other electives with the approval of the student's adviser and Dean.

Pre-Veterinary Medicine Option

The following curriculum is open only to students who are bona fide residents of the State of Alabama, and the nine quarters (159 quarter hours) meet the minimum requirements for admission to the School of Veterinary Medicine. Satisfactory completion of the remaining requirements of the Animal-Dairy Sciences curriculum or completion of two years in the Veterinary Medicine curriculum entitle the student to the B.S. degree in Animal and Dairy Sciences.

FRESHMAN YEAR									
First Quarter			Second Quarter			Third Quarter			
CH 103	Fund. of Chem. & Lab.	5	CH 104	Fund. of Chem. & Lab.	5	ADS 200	Intr. An. & Dairy Sci.	5	
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	CH 105	Fund. of Chem. & Lab.	5	
ADS 101	Man's Food	3	EH 102	English Comp.	3	EH 103	English Comp.	3	
EH 101	English Comp.	3	HY 101	World History	3	HY 102	World History	3	
PE 101	Fnds. of Physical Education	1	PE 102	Begin. Swim	1	PE	From Group II	1	

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101	Prin. of Biology.....5	ADS 204	Animal Biochem. & Nutr.....5	BI 102	Plant Biology.....5
CH 207	Organic Chem. & Lab.....5	BI 103	Animal Biology.....5	ZY 316	Physiol. of Dom. Anim.....5
ADS 210	Intr. Meat Sci. & Technol.....4	CH 208	Organic Chem. & Lab.....5	PS 205	Intr. Physics.....5
HY 103	World History.....3	EH 141	Med. Vocabulary.....3	ADS 309	Live An. Eval.....3
JUNIOR YEAR					
PS 206	Intr. Physics.....5	ADS 506	Animal Reprod.....5	ADS 503	Animal Breeding.....5
BY 300	Microbiol.....5	ADS 508	Adv. An. Nutr.....5	AEC 202	Ag. Economics.....5
ZY 300	Genetics.....5	AY 304	General Soils.....5	PO 209	American Govt.....5
ADS 302	Feeds & Feeding.....4	JM 315	Technical Journalism.....3		Elective.....3

(Students may choose 6 hours of basic military science, in consultation with their advisers.)

See also, Curriculum in Pre-Veterinary Medicine (PV), School of Arts and Sciences

Horticulture (HF)

The Horticulture major is designed to prepare the student for a future in the fruit or vegetable industry. Advanced study in Horticulture leads to professional positions in teaching, research, or extension.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
BI 101	Prin. of Biology.....5	BI 102	Plant Biology.....5	CH 104	Fund. Chem. & Lab.....5
MH 160	Pre-Cal. w. Trig.....5	EH 102	English Comp.....3	MH 161	An. Geom. & Cal.....5
EH 10	English Comp.....3	HY 101	World History.....3	EH 103	English Comp.....3
HF 101	Intr. to Hort.....1	CH 103	Fund. Chem. & Lab.....5	HY 102	World History.....3
	Basic ROTC†.....1		Basic ROTC†.....1		Basic ROTC†.....1
PE 101	Fnds. of Phys. Ed.....1	PE 102	Begin. Swim.....1	PE	From Group II.....1

SOPHOMORE YEAR

HF 224	Plant Propagation.....5	BI 103	Animal Biology.....5	GL 110	Physical Geo.....5
HF 221	Landscape Garden.....5	AEC 202	Ag. Economics I.....5	HF 201	Orchard Mgt.....5
SC 211	Public Speaking.....5	CH 207	Organic Chem. & Lab.....5	PS 200	Fnds. of Physics.....5
HY 103	World History.....3	JM 315	Technical Journalism.....3		Basic ROTC†.....1
	Basic ROTC†.....1		Basic ROTC†.....1		

JUNIOR YEAR

AN 350	Soil and Water Technology.....5	AEC 301	Ag. Marketing.....5	AY 502	Soil Fertility.....5
BY 306	Fund. of Plant Physiology.....5	HF 308	Vegetable Crops.....5	BY 309	Plant Pathology.....5
	Electives.....8	AY 304	General Soils.....5	ZY 300	Genetics.....5
			Elective.....3		Elective.....3

SENIOR YEAR

AEC 501	Farm Management.....5	HF	Elective*.....4	HF 501	Corn. Veg. Crops.....5
AY 312	Weed Sci.....5		Agri. Engineering.....5	ZY 502	Economic Ento.....5
	Elective.....6		Elective.....5	HF	Elective*.....4
			Elective.....8		Elective.....3

TOTAL—210 QUARTER HQURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*Students are required to take two of the following Horticulture electives: HF 504, Fruit Growing; HF 505, Small Fruits; HF 506, Nut Culture.

Poultry Science (PH)

A program is offered with the option of science or business. In most cases students anticipating study beyond the B.S. degree should choose electives for the science option. The electives in the business area provide the student opportunity to prepare for sales, service, and related agribusiness professions.

FRESHMAN YEAR														
First Quarter					Second Quarter					Third Quarter				
BI	101	Prin. of Biology	5		BI	102	Plant Biology	5		BI	103	Animal Biology	5	
CH	103	Fund. of Chem. & Lab.	5		CH	104	Fund. of Chem. & Lab.	5		GL	101	Intr. Geology I	5	
MH	160	Pre-Cal. w. Trig.	5		MH	161	An. Geom. & Cal.	5		HY	101	World History	3	
PE	101	Basic ROTC†	1		EH	101	English Comp.	3		EH	102	English Comp.	3	
		Fnds. of Phys. Ed.	1				Basic ROTC†	1				Basic ROTC†	1	
SOPHOMORE YEAR														
CH	207	Organic Chem. & Lab.	5		AEC	202	Ag. Economics I	5		ADS	204	An. Biochemistry & Nutrition	5	
PH	201	Poultry Science	5		PA	211	Intr. to Deductive Logic	3		PS	200	Fnds. of Physics or		
HY	102	World History	3		HY	103	World History	3		PS	205	Intr. Physics*	5	
EH	103	English Comp.	3		SC	202	App. Sp. Comm.	3		PG	212	Psychology	3	
		Basic ROTC†	1				Basic ROTC†	1				Basic ROTC†	1	
PE	102	Begin. Swim	1		PE		From Group II.	1				Elective	3	
JUNIOR YEAR														
AY	304	General Soils	5		RSY	261	Rural Sociology	5		AEC	301	Ag. Marketing	5	
PH	302	Poultry Meat Prod.	3		ZY	300	Genetics	5		SC	273	Group Prob. Solv. through Discussion	5	
EH	304	Technical Writing	3				Electives	8				Electives	8	
BY	300	General Microbiology	5											
		Elective	3											
SENIOR YEAR														
ZY	502	Economic Entomology or			PH	504	Poultry Mgt.	5		AEC	501	Farm Management	5	
ZY	511	General Parasitology	5		PH	508	Control of Poultry Diseases & Parasites	5		PH	511	Processing & Mkt.	3	
PH	505	Poultry Feeding	3				Electives	8				Electives	9	
		Electives	8											

TOTAL—210 QUARTER HOURS

*Students choosing the science option should take PS 205 to prepare for more work in these areas.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Of the 47 hours of electives, 30 must be selected from the list that is available in the offices of the adviser and Dean and must be approved by them.

Agricultural Business And Economics (AEC)

The curriculum in Agricultural Business and Economics is for students who plan a career in business closely related to agriculture, and for those interested in the economics of agricultural production and marketing and in public policies affecting agriculture.

The curriculum combines both business and technical agricultural courses, and through selection of electives it provides an opportunity for students to emphasize training in agribusiness, in agricultural economics, in food science, in humanities, or in selected production fields.

The demand for graduates who have both business and applied agricultural training is increasing. In both public and private agencies, increasing attention to rural economic and social problems points to enlarged opportunities for qualified workers in teaching, research, sales, public relations, services, administration, and private employment in these fields. By electing

appropriate courses in the food science management area, Agricultural Business and Economics students can prepare for management positions in the vast food industry.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal w. Trig.	5	MH 161	An. Geom. & Cal.	5	CH 104	Fund. Chem. & Lab.	5
BI 101	Prin. of Biology	5	CH 103	Fund. Chem. & Lab.	5	BI 102	Plant Biology	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
PE 101	Fnds. of Phys. Ed.	1	PE 102	From Group II	1	PE 102	Begin. Swim.	1
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1

SOPHOMORE YEAR

ADS 204	Animal Biochem. & Nutrition	5	PO 209	Intr. Am. Govt.	5	EC 274	Bus. & Econ. Stat. I.	5
AEC 202	Ag. Economics I	5	PS 200	Fnds. of Physics	5	RSY 261	Rural Sociol.	5
BI 103	Animal Biology	5	ACF 211	Prin. of Acct.	4	ACF 212	Prin. of Acct.	4
	Basic ROTC†	1	SC 202	App. Sp. Comm.	3		Basic ROTC†	1
				Basic ROTC†	1		Elective	3

JUNIOR YEAR

ADS 200	Intr. An. & Dairy Sc.*	5	AEC 301	Ag. Marketing	5	AN 351	Ag. Mach. Tech.***	5
AY 307	Gen. Soils	5	PH 201	Gen. Poultry	5	EC 360	Money and Banking	5
EH 315	Bus. and Prof. Report Writing I	3	AEC 307	Ag. Law**	5	AEC 206	Ag. Econ. II	5
	Elective	3		Elective	3		Electives	3

SENIOR YEAR

EC 552	Comp. Econ. Systems or		AY 401	Forage Prod. or		AEC 501	Farm Management	5
EC 556	Inter. Macro-econ.	5	AY 301	Grain Prod.	5	AEC 505	Ag. Policy	3
AEC 510	Ag. Bus. Mgt.	3	FY 313	Farm Forestry	5		Electives	8
EH 415	Written Bus. Comm.	3	AEC 503	Ag. Prices	3			
	Elective	6	AEC 490	Senior Seminar	1			
				Elective	5			

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*ADS 501, ADS 502, or ADS 504 may be substituted.

**MN 241, Business Law, 4 cr. may be substituted for AEC 307 or taken in addition as an elective.

***AN 350, AN 352, AN 353 or AN 354 may be substituted.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Agricultural Engineering (AN)

This technical field trains engineers in the agricultural areas. The curriculum includes courses basic to all types of engineering, courses with particular emphasis on engineering problems in agriculture, and general agricultural courses. Students completing the curriculum have opportunities in many types of work where both engineering and agricultural knowledge are required.

The Agricultural Engineering curriculum is accredited by the Engineers' Council for Professional Development.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
BI 101	Prin. of Biology	5	CH 103	Gen. Chem. & Lab.	5	CH 104	Gen. Chem. & Lab.	5
AN 101	Intr. to Ag. Eng.	2	EH 101	English Comp.	3	EH 102	English Comp.	3
TS 102	Graph. Comm. & Design	2	AN 102	Ag. Engr. Prin.	2	PE 102	From Group II	1
PE 101	Fnds. of Phys. Ed.	1	PE 102	Begin. Swim.	1		Basic ROTC†	1
	Basic ROTC†	1		Basic ROTC†	1			

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	PS 221	Gen. Physics II	4	ME 202	Engr. Mat. Science	3
BI 102	Plant Biology	5	ME 207	Strength of Mat. or		CHE 331	Engr. Thermodyn	3
PS 220	Gen. Physics I	4	CE 207	Mech. of Solids	3		or	
ME 205	Appl. Mech. Stat. or		EH 103	English Comp.	3	ME 301	Thermodynamics I	4
CE 205	Engr. Mech.-Stat.	4	BY 103	Animal Biol.	5	ME 321	Dynamics I	4
	Basic ROTC†	1	MH 265	Diff. Equat.	3	PS 222	Gen. Physics II	4
				Basic ROTC†	1	IE 204	Comp. Prog.	3
							Basic ROTC†	1

JUNIOR YEAR

AN 303	Soil & Water		AEC 202	Ag. Econ. I	5	MH	Elective	3
	Engr. I	3	EE 263	Circuit Anal. II	4	AN 306	Elec. Systems	3
AN 303L	Soil and Water		AN 302	Mech. of Trac.		AN 304	Drain. & Irrig.	3
	Engr. I, Lab	1		Power	3		Ag. Engr.	
EE 261	Circuit Anal. I	3	AN 305	Agric. Proc. Eng.	3		Elective	3
AN 301	Mech. of Farm			History Elective*	3		Elect. Engr. Elective	3
	Mach.	3					History Elective*	3
AN 307	Structures Des. I	3						
CHE 352	Fluid Mech.	4						
	or							
ME 340	Fluid Mech.	3						
	History Elective*	3						

SENIOR YEAR

AY 307	Gen. Soils	5		Hum.-Soc. Elective	5		Social & Hum.	
SC 202	App. Sp. Comm.	3		Ag. Elective	5		Elective	7
	Engr. Electives	11		Ag. Engr. Elective	3		Ag. Elective	5
				Engr. Elective	3		Engr. Elective	3

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

SC 202 will be waived for students who complete a year of Advanced ROTC.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

*Students may choose Technology and Civilization HY 204, 205, 206 or World History 101, 102, 103.

Biological Sciences (BI)

Botany

The Botany major is for those students interested in fundamental plant science. The required courses serve as a basis for plant knowledge and future study. Proper elective selection prepares the student for various careers in the plant sciences. The curriculum is administered through a faculty advisory system for the best interests and needs of each student.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	BI 103	Animal Biology	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	CH 103	Fund. Chem.	
EH 101	English Comp.	3	EH 102	English Comp.	3		& Lab.	5
HY 101	World History	3	HY 102	World History	3	EH 103	English Comp.	3
	Basic ROTC†	1		Basic ROTC†	1	HY 103	World History	3
							Basic ROTC†	1

SOPHOMORE YEAR

CH 104	Fund. Chem		CH 207	Org. Chem. & Lab.	5	BY 300	Gen. Micro-	
	Lab.	5	BY 309	Gen. Plant			Biology I	5
ZY 300	Genetics	5		Pathology	5	CH 208	Org. Chem.	
EC 200	Gen. Economics or		GL 110	Phys. Geol.	5		& Lab.	5
AEC 202	Ag. Economics I	5		Basic ROTC†	1	ZY	Zoology Elective	5
	Basic ROTC†	1	PE 102	Begin. Swim	1		Basic ROTC†	1
PE 101	Fnds. of Phys. Ed.	1				PE	From Group II	1

JUNIOR YEAR

SC 211	Public Speaking	5	PS 206	Intr. Physics	5	BY 306	Fund. Plant	
PS 205	Intr. Physics	5	AY 304	General Soils	5		Physiology	5
BY 215	Intr. Biol. Stat. or		EH 304	Tech. Writing or		ZY	Zoology Elec	5
BY 501	Biol. Statistics	5	EH 315	Bus. & Prof. Wri	3	PA	Philosophy Elec	3
	Elective	3		Elective	5		Elective	5

SENIOR YEAR											
First Quarter				Second Quarter				Third Quarter			
BY	513	Gen. Plant Ecology	5	BY	515	Plant Anatomy	5	BY	506	Systematic Botany	5
FL	121	French or		FL	122	French or				Electives	13
FL	151	German	5	FL	152	German	5				
ZY		Zoology Elective	5			Electives	8				
		Elective	3								

TOTAL—210 QUARTER HOURS

‡Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Microbiology

FRESHMAN YEAR

Fall Quarter				Winter Quarter				Spring Quarter			
BI	101	Prin. of Biol.	5	BI	102	Plant Biol.	5	BI	103	Animal Biol.	5
MH	160	Pre-Cal. w. Trig.	5	MH	161	An. Geom. & Cal.	5	CH	103	Fund. Chem. & Lab.	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
		Basic ROTC ‡	1			Basic ROTC ‡	1			Basic ROTC ‡	1

SOPHOMORE YEAR

AEC	202	Ag. Econ. 1 or		CH	207	Org. Chem. & Lab.	5	BY	300	Gen. Microbiol. I.	5
EC	200	Gen. Economics	5	FL	121	French or		CH	208	Org. Chem. & Lab.	5
CH	104	Fund. Chem. & Lab.	5	FL	151	German*	5	FL	122	Elem. Fr. or	
PS	205	Intr. Physics	5	PS	206	Intr. Physics	5	FL	152	Elem. German*	5
PE	101	Fnds. of Phys. Ed.	1	PE	102	Begin. Swim.	1	PE		From Group II	1
		Basic ROTC ‡	1			Basic ROTC ‡	1			Basic ROTC ‡	1

JUNIOR YEAR

CH	518	Biochemistry	5	CH	519	Biochemistry	5			Electives	18
ZY	300	Genetics	5	SC	211	Public Speaking	5				
PA	210	Intr. Philosophy	3			Elective	8				
		Elective	5								

SENIOR YEAR

54 elective hours to be arranged in consultation with adviser.

During Junior and Senior years, students must take 87 hrs. of electives. These may be selected from the following 3 groups with at least 30 from A, an additional 15 from A or B, and the remaining 42 from A, B, or C.

Group A

ADS	514	Food Microbiology	5
BY	216	Intr. Biol. Computat.	3
BY	446	Clinical Microbiology	5
BY	503	Microbial Taxonomy	5
BY	504	Int. Industrial Microb.	3
BY	540	Microbial Physiology	3
BY	540L	Microbial Phys. Lab.	3
BY	542	Virology	5
BY	543	Immunology	5
BY	544	Microbiological Methods	5
LT	301	Hematology	5

Group B

ADS	515	Food Plant Sani.	5
BY	215	Int. Biol. Stats.	5
BY	309	Gen. Plant Pathology	5
BY	505	Intr. Mycology	5
BY	508	Marine Microbiology	7
BY	511	Phycology	5
BY	516	Biological Microscopy	5
BY	541	Sanitary Microbiology	5
CH	520	Clinical Biochemistry	5
EH	304	Technical Writing	3
FAA	516	Biological Productivity & Water Quality	5
HF	543	Food Anal. & Qual. Cntrl.	5
MN	344	Environment Law	4
ZY	511	Parasitology	5
ZY	524	Animal Physio.	5

Group C

University courses not included in Groups A or B. Selection to be determined in consultation with adviser.

TOTAL—210 QUARTER HOURS

During the sophomore year students will develop a plan of study for the junior and senior years from lists of approved elective courses with the assistance and approval of their adviser and dean. Substitutions may be permitted to meet specific needs of individual students.

*Any foreign language acceptable, French or German are preferred.

‡Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Zoological Sciences

Majors in zoological sciences are for students interested in careers in animal biology. One has the choice of five options: zoology, entomology, fisheries, marine biology, or wildlife, and degrees are offered in each option. During the first two years, all students take the same subjects which emphasize the basic sciences and background courses. Thereafter, it is possible to elect courses to fit specific needs of the student in his or her option.

Entomology, Fisheries Management, Marine Biology, Wildlife Management, and Zoology

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter					
BI	101	Prin. of Biology	5	BI	102	Plant Biology	5	BI	103	Animal Biology	5
CH	103	Fund. Chem. & Lab.	5	CH	104	Fund. Chem. & Lab.	5	MH	162	An. Geom. & Cal.	5
MH	160	Pre-Cal. w. Trig.	5	MH	161	An. Geom. & Cal.	5	PS	205	Intr. Physics	5
PE	101	Fnds. of Phys. Ed.	1	PE	102	Begin. Swim.	1	PE		From Group II	1
		Basic ROTC†	1			Basic ROTC†	1			Basic ROTC†	1

SOPHOMORE YEAR

PS	206	Intr. Physics	5	ZY	303	Syst. & Evolution	5	CH	208	Organic Chem. & Lab.	5
ZY	300	Genetics	5	CH	207	Organic Chem. & Lab.	5	ZY	306	Prin. of Ecology	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
		Basic ROTC†	1			Basic ROTC†	1			Basic ROTC†	1

JUNIOR YEAR

54 hours to be arranged in consultation with adviser.

SENIOR YEAR

54 hours to be arranged in consultation with adviser.

TOTAL HOURS REQUIRED—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

ADDITIONAL COURSES TO BE TAKEN BY ALL MAJORS

AEC	202	Ag. Economics I	5	ZY	310	Cell Biology	5
BY	300	General Microbiology	5	ZY	511	Parasitology**	5
SC	202	Appl. Sp. Comm.	3	ZY	521 or 522	Vert. Zoology*	5
ZY	301	Comp. Anatomy	5	ZY	524	Animal Physiology	5
ZY	304	Gen. Entomology	5	ZY	501	Invert. Zoology**	5

*Except Fisheries

**Fisheries students will take BY 306 and FAA 538 in lieu of these courses

***Except Wildlife

The remaining requirements will include a minimum of 17 hours selected from the humanities and social sciences and at least 35 hours of group electives selected with the advice of the adviser and approval of the Dean. At least 10 hours of the group electives must be selected from the following botanical sciences: BY 306, 309, 506, 509, 513, 514, and 515. Recommended electives from the humanistic social sciences and group electives are available from the adviser and Dean. All students in Marine Biology must spend at least one quarter at a marine biology laboratory and take 15 to 18 hours of course work there. Students in wildlife must take ZY 528 and ZY 531.

Biological Sciences and Teacher Education

Students in the Biological Sciences curriculum with majors in either botanical or zoological sciences who wish also to prepare for certification as teachers in secondary schools may pursue the dual objective of completing the requirements for the B.S. degree in their particular Biological Sciences major and the requirements of the Teacher Education Program.

Students who choose the dual objective program should declare this intent to their departmental advisers by the end of their sophomore year if possible. Students pursuing the dual objective plan will be assigned an adviser in the School of Education who will advise them on all matters involving requirements for completing the Teacher Education Program. (See detailed discussion of admission and retention procedures for teacher education on page 134.)

In addition to the specific requirements, including group electives required for the B.S. in Zoological Sciences or Botany, these students must also include the following courses in their curriculum:

EH	Literature (253, 254, 255 or 260, 261, 262)	9
SY	201 Introduction to Sociology	5
JED	101 or	
SED	102K Freshman or Transfer Orientation	1
EM	200 Educational media	2
CED	322 Human Relations Training in Teacher Education	2
AED	481 Organization, Administration and Financing of American Public Education	2
FED	300 Educational Psychology (Pr., Soph. Stdg.)	5
FED	350 Cultural Foundations of Education (Pr., Jr. Stdg.)	5
FED	400 Evaluation in Education (Pr., Sr. Stdg.)	5
SED	405K Teaching in Secondary School-Science	3
SED	410K Program in Secondary School-Science	3
SED	425K Professional Internship	15

None of the above courses may be used as group electives toward the degree in zoological sciences or botany, but literature, sociology, FED 300, or FED 350 may be used as needed as humanistic-social electives. Students should also elect 10 additional hours of chemistry to satisfy the requirements for a chemistry minor. Students in the Zoological Sciences curriculum must elect at least 5 hours of botanical sciences in addition to the 10 hours required of all zoological sciences majors.

Food Science (FS)

The Food Science curriculum, administered by an interdepartmental committee, is designed for those interested in the nation's gigantic food industry. Students may use their electives for a general program or for specializing in a commodity such as dairy, meat, fruit, or vegetable products. They may choose to emphasize business, technology, or science areas.

FRESHMAN YEAR			
First Quarter		Second Quarter	
CH 103	Gen. Chem. & Lab.	CH 104	Gen. Chem. & Lab.
MH 160	Pre-Cal w/Trig	MH 161	An. Geom. & Cal.
FS 101	Man's Food	EH 102	English Comp.
EH 101	English Comp.	HY 101	World History
	Basic ROTC†		Basic ROTC†
Third Quarter			
BI 101	Prin. of Biology	CH 207	Organic Chem. & Lab.
CH 207	Organic Chem. & Lab.	EH 103	English Comp.
EH 103	English Comp.	HY 102	World History
HY 102	World History		Basic ROTC†
SOPHOMORE YEAR			
AEC 202	Agr. Econ. I or	ADS 204	Anim. Biochem.
EC 200	Gen. Economics	BI 102	Plant Biology
PS 200	Found. Phys. or	HY 103	World History
PS 205	Intr. Physics	EH 315	Bus & Prof
FS 201	Intr. Food Sci		Report Writing
	and Technology	PE 102	Begin Swimming
PE 101	Fund. of PE		Basic ROTC†
	Basic ROTC†		
JUNIOR YEAR			
FS 355	Food Engineering	FS 543	Food Chemistry
FS 340	Indust Food	NF 372	Fund of Nutr
	Pres Tech		Electives*
BY 300	Gen. Microbiology		
	Electives		
SENIOR YEAR			
		FS 515	Food Plant
			Sani
		FS 429	Food Sci Sem
			Electives*

TOTAL—210 QUARTER HOURS

†Students may select 6 hours of electives as approved by their adviser and dean in lieu of ROTC.

*The student will complete a minimum of 54 hours, including 6 hours of Food Processing, from a list of recommended electives that is available in the offices of the adviser and dean and must be approved by them.

Forest Engineering (FYE)

This curriculum combines professional courses in engineering and forestry for students who want careers in the forest industries that require training in both engineering and forestry. It has been developed to meet the accreditation requirements of both the Engineer's Council for Professional Development and the Society of American Foresters.

First Quarter			FRESHMAN YEAR			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	EC 200	Econ. I	5
TS 102	Graph. Comm. & Design	2	IE 204	Comp. Prog.	3	CH 103	Fund. of Chem. & Lab.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
PE 101	Fund. of Phys. Ed.	1	PE 102	Begin. Swim	1	PE	From Group II	1
Second Quarter			SOPHOMORE YEAR					
MH 264	An. Geom. & Cal.	5	ME 207	Strength of Mat.	3	AY 305	Gen. Soils	5
PS 220	Gen. Physics I	4	PS 221	Gen. Physics II	4	PS 222	Gen. Physics III	4
ME 205	Appl. Mech. Stat.	4	ME 202	Engr. Mat. Science	3	ME 301	Thermodynamics I	4
CH 104	Fund. of Chem. & Lab.	5	MH 265	Diff. Equat.	3	ME 321	Dynamics I	4
			EC 202	Econ. II	5			
			SUMMER CAMP**					
			FY 300	Intr. to Forestry	2			
			FY 301	Dendrology	3			
			FY 302	Forest Biology	2			
			FY 304	Forest Surveying	4			
			FY 305	Field Mensuration	3			
			FY 306	For. Cartography	1			
			JUNIOR YEAR					
FY 313	Sampling I	4	FY 314	Sampling II	4	FY 421	For. Ecology	5
	Elective (Social Sci. & Humanities)	5	FY 415	For. Mensuration	5	FY 517	Photogrammetry	5
AN 301	Mech. of Farm Machinery	3	EE 263	Circuit Analysis II	4	ACF 211	Accounting	4
ME 340	Fluid Mech.	3	AN 302	Mech. of Trac. Power	3		Engr. Elective	3
EE 261	Circuit Analysis I	3		History or Literature***	3			
			SENIOR YEAR					
FY 540	For. Econ.	4	FY 541	For. Mgt. & Admin.	4	AN 501	Ag. Power & Mach. Design	3
FY 520	Silviculture	5	FY 570	Harvesting	3	FY 571	Adv. Harv.	3
AN 401	Forest Machinery	3	AN 402	Roads & Struc.	3		History or Literature	3
	Engr. Elective	3		Social Sci. & Humanities Elective	5		Engr. Elective	8
	History or Literature	3						

TOTAL — 225 QUARTER HOURS

*Students whose combined ACT scores for English and Mathematics are lower than 50, or whose total SAT scores are less than 1100, are enrolled in MH 160 for no credit.

**Summer Camp may be taken at the end of either the Freshman or Sophomore years. It may be taken between the Freshman and Sophomore years by a transient student who is regularly enrolled at another institution and is planning to transfer to Auburn University.

***Selected from one of the following sequences: HY 101-102-103; HY 204-205-206; EH 260-261-262.

Forestry

Two curricula are offered in forestry, one in forest management and the other in wood technology. The former leads to the degree of Bachelor of Science in Forestry while the other leads to the degree of Bachelor of Science in Wood Technology. The Department also offers an honors program which leads to the degree of Bachelor of Science in Forestry (Honors Program).

The Department of Forestry is accredited by the Society of American Foresters.

Forest Management (FY)

First Quarter				FRESHMAN YEAR				Third Quarter			
BI	101	Prin. of Biology	5	BI	102	Plant Biology	5	SC	211	Public Speaking	5
MH	161	An. Geom. & Cal.*	5	MH	162	An. Geom. & Cal.	5	MH	163	An. Geom. & Cal.	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
		Basic ROTC**	1			Basic ROTC	1			Basic ROTC	1
PE	101	Fnds. of Phys. Ed.	1	PE	102	Begin. Swim	1	PE		From Group II	1
				SUMMER CAMP***							
				FY	300	Intr. to Forestry	2				
				FY	301	Dendrology	3				
				FY	302	Forest Biology	2				
				FY	304	Forestry Surveying	4				
				FY	305	Field Mensuration	3				
				FY	306	Forest Cartography	1				
				SOPHOMORE YEAR							
CH	103	Fund. of Chem. & Lab.	5	CH	104	Fund. of Chem. & Lab.	5	PS	200	Found. of Physics	5
		Economics****	5			Economics	5	ACF	211	Prin. of Account.	4
EH	304	Tech. Writing	3	IE	204	Comp. Prog.	3	GL	110	Phys. Geology	5
		History or Lit.†	3			History or Lit.	3			History or Lit.	3
		Basic ROTC	1			Basic ROTC	1			Basic ROTC	1
				JUNIOR YEAR							
FY	313	Sampling I	4	FY	314	Sampling II	4	FY	421	For. Ecology	5
FY	320	For. Tree Physiol.	3	FY	415	For. Mensuration	5	FY	422	For. Geography	2
MN	241	Business Law†	4	AY	305	Gen. Soils	5	FY	462	For. Rec. Plan. & Mgt.	3
		Elective‡‡	5	FY	439	Wood ID & Prod.	3	FY	517	Photogram	5
				SENIOR YEAR							
FY	540	For. Econ.	4	FY	541	For. Mgt. & Admin.	4	FY	481	For. Prob. II	4
FY	520	Silviculture	5	FY	445	For. Fire Cont. & Use	3	FY	542	For. Policy	3
ZY	305	For. Entomology	3	FY	570	Harvesting	3	ZY	425	For. Wildlife Mgt.	3
		Elective	5	FY	480	For. Prob. I	0	BY	310	For. Pathology	3
						Elective	5			Elective	5
TOTAL — 210 QUARTER HOURS											

*Students whose combined ACT scores for English and mathematics are lower than 50, or whose total SAT scores are less than 1100, are enrolled in MH 160 for no credit.

**Students may choose six hours of electives in lieu of basic ROTC in consultation with their academic advisers.

***Summer camp may be taken at the end of either the Freshman or Sophomore years. It may be taken between the Freshman and Sophomore years by a transient student who is regularly enrolled at another institution and is planning to transfer to Auburn University. Co-op students should take Summer Camp at the end of the Freshman Year.

****Selected from one of the following sequences: EC 200-202 or SEC 202-206.

†Selected from one of the following sequences: HY 101-102-103; HY 204-205-206; or EH 260-261-262.

‡AEC 307, Agricultural Law may be substituted for MN 241, Business Law.

‡‡At least one elective course must be chosen from the humanities.

HONORS PROGRAM IN FORESTRY

The Honors Program in Forestry provides able students opportunity to explore in depth areas in which they are interested and to prepare for graduate school. The program is flexible, permitting concentration of effort in areas of the student's choosing.

Students with at least five quarters remaining in the Forest Management curriculum and with a grade point average of 2.90 or better may apply for admission to the program.

JUNIOR YEAR											
First Quarter				Second Quarter				Third Quarter			
FY	313	Sampling I	4	FY	314	Sampling II	4	FY	421	For. Ecology	5
FY	320	For. Tree Physiol.	3	FY	415	For. Mensuration	5	BY	501	Biolog. Stat. or	
		Electives*	9	AY	305	Gen. Soils	5	EC	574	Bus. & Econ. Stat. II	5
						Elective	3			Elective	

SENIOR YEAR

FY 540	For. Econ.	4	FY 541	For. Mgt. & Admin.	4	FY 581	For. Prob. II	4
FY 520	Silviculture	5	FY 580	For. Prob. I	0		Electives	14
	Electives	8	FY 499	Honors Project	2-5			
				Electives	6-9			

TOTAL — 210 Quarter Hours

*At least one elective course must be chosen from the humanities.

Twenty-five of the free elective hours are to be chosen under the supervision of the faculty adviser, so as to develop a distinct program leading to a pre-determined goal.

Wood Technology (WT)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
CH 103	Fund. Chem.		CH 104	Fund. of Chem.		CH 105	Gen. Chem.	
	& Lab.	5		& Lab.	5		& Lab.	5
MH 160	Pre-Cal w. Trig.	5	MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5
FY 105	For. Convocation*	0		Basic ROTC†	1	PE	From Group II	1
	Basic ROTC†	1	PE 102	Begin. Swim.	1		Basic ROTC†	1
PE 101	Fnds. of Phys. Ed.	1						

SOPHOMORE YEAR

BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	BI 103	Animal Biology	5
PS 205	Intr. Physics	5	PS 206	Intr. Physics	5	FY 206	Wood Measure**	3
MH 163	An. Geom. & Cal.	5	ADS 204	An. Biochem. &		TS 102	Graph. Comm. & Des.	2
	Basic ROTC†	1		Nut.	5	FY 205	Wood Ident. & Uses	3
				Basic ROTC†	1	EH 304	Technical Writing	3
							Basic ROTC†	1

JUNIOR YEAR

EC 200	Gen. Economics	5	FY 532	Seasoning & Preserv.**	5	PG 211	Psychology	5
FY 201	Dendrology	5		For. Research		FY 533	Seas. & Preserv.	
FY 311	Wood Anatomy**	5		Meth.***	3		Lab.	2
SC 202	App. Sp. Comm.***	3		Electives	10		Electives	10

SENIOR YEAR

FY 330	For. Products**	5	FY 525	Wood Glu. & Lam.**	5	FY 531	Mech. Prop. of Wood**	5
	Electives	13		Electives	13		Electives	13

TOTAL—210 QUARTER HOURS

One minor, consisting of 30 hours in the area of Mathematics, Chemistry, Engineering, or Management is required. In addition, 10 hours in computer programming and 10 hours in statistics, including laboratory are to be selected from the electives. From the remaining elective hours, 10 are to be selected with the adviser in the general area of humanities. A student may always substitute a more intensive group of courses for one or more of the required courses, providing the same breadth of coverage is maintained. Minor courses to be selected from approved list in Dean's office.

As a part of the requirement for the degree with a major in wood technology the student must complete a minimum of three weeks of supervised tours of forest products industries. A satisfactory report on these tours is to be submitted to the department head by the beginning of the final quarter prior to graduation.

*This course to be taken in all except summer quarters.

**Alternate year offering.

***Any approved course in public speaking may be substituted for SC 202. The requirement for SC 202 will be waived for students completing one year of advanced ROTC.

****Any three or five hour course in statistics may be substituted for FY 521.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Landscape And Ornamental Horticulture (OH)

The Landscape and Ornamental Horticulture curriculum provides professional and basic knowledge and develops basic skills in four areas: Florist Crop Production, Landscape Design, Nursery Crop Production, and Retail

Flower Shop Management. By the end of the sophomore year the student will choose one of these areas as his major option, and will schedule the courses prescribed for that option in the junior and senior years.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. Biology	5	BI 102	Plant Biology	5	CH 104	Fund. Chem. & Lab	5
MH 160	Pre-Cal w. Trig.	5	CH 103	Fund. Chem. & Lab*	5	MH 161	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HF 101	Intr. Hort.	1	HY 101	World History	3	HY 102	World History	3
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1
HPR 101	Fnds. Phys. Ed.	1	HPR 102	Beginn Swim	1	HPR	From Group II	1

SOPHOMORE YEAR

BI 103	Animal Biology	5	AEC 202	Ag. Economics I	5	CH 207	Organic Chem. & Lab.	5
HF 224	Plant Propagation	5	SY 201	Intr. to Sociology	5	HF 221	Landscape Gardening	5
SC 211	Public Speaking	5		Basic ROTC†	1		Basic ROTC†	1
HY 103	World History	3		Electives	5		Electives	5
	Basic ROTC†	1						

JUNIOR YEAR

54 hours in selected option to be arranged in consultation with adviser.

SENIOR YEAR

53 hours in selected option to be arranged in consultation with adviser.

TOTAL HOURS REQUIRED—210 QUARTER HOURS

*Students not qualified to take CH 103 will take CH 101 in first quarter and will take CH 102 and CH 103L in their second quarter.

†Students may choose 6 hrs. of electives in lieu of Basic ROTC in consultation with their academic advisers.

ADDITIONAL COURSES TO BE TAKEN BY ALL OPTIONS

AY 304	General Soils	5	BY 506	Systematic Botany	5
AY 502	Soil Fertility or AY 506 Fertilizers & Soil Testing	5	EH 390	Advanced Composition	5
BY 306	Plant Physiology	5	HF 323	Ghse. Environ. Control	5
BY 309	Plant Pathology	5	ZY 502	Economic Entomology	5

REQUIRED ELECTIVES FOR VARIOUS OPTIONS

Florist Crop Production

Objective: To train students in production, marketing and management of floricultural crops.

The following courses, with credit hours shown, are required: ACF 211-Prin. of Acct.-4, HF 225-Flower Arranging-3, HF 308-Vegetable Crops-5, HF 522-Fund. of Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-5, MN 241-Business Law-4, ZY 300-Genetics-5.

Landscape Design

Objective: to train students in the principles and practices of Landscape Design. The following courses with credit hours shown, are required: HF 324-Elements and Prin. of Landscape Design-5, HF 427-Intermediate Landscape Design-5, HF 521-Care and Maint. Orn. Plants-5, MN 241-Business Law-4, AY 315 Turfgrass Mgt.-5, HF 222-Trees-5, HF 223-Evergreen Shrubs and Vines-5, HF 321-Deciduous Shrubs and Vines-5; and five hours to be selected from the following areas: AN 350 Soil and Water Technology-5, HF 523-Nursery Mgt.-5, GL 102-Intr. Geology-5, AT 122-Fund.-5.

Nursery Crop Production

Objective: To train students in production, marketing, and management of nursery products.

The following courses, with credit hours shown, are required: AY 315 Turfgrass Mgt.-5, HF 201-Orchard Management-5, HF 521-Care & Maint. Orn. Plants-5, HF 523-Nursery Mgt.-5, ZY 300-Genetics-5; ten hours to be selected from the following 3 courses: HF 222-Trees-5, HF 223-Evergreen Shrubs & Vines-5, HF 321-Deciduous Shrubs & Vines-5; and 4 hrs. to be selected from the following 2 courses: ACF 211-Prin. of Acct.-4, MN 241-Business Law-4.

Retail Flower Shop Management

Objective: To train students to be managers of retail flower shop operations. Both art and business management are involved.

The following courses, with credit hours shown, are required: ACF 211-Prin. of Acct.-4, HF 225-Flower Arranging-3, HF 522-Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-5, MN 241-Business Law-4, MT 331-Prin. of Marketing-5, MT 433-Retail Store Management-5; plus 4 or 5 hrs. to be selected from the following 3 courses: ACF 212-Prin. of Acct.-4, MN 242-Business Law II-4, MT 437-Sales Management-5.

OTHER ELECTIVES

Additional electives to make a total of 210 hours in a given option are to be selected with the approval of the adviser and dean.

Plant Protection (PLP)

Plant protection, an interdepartmental curriculum, is designed for those undergraduate students interested in the protection of man's crops from diseases, insects, weeds, rodents, and other pests. Students may utilize their electives to emphasize their special interest in protection of crops from one group of pests listed above.

FRESHMAN YEAR		
First Quarter		Third Quarter
BI 101 General Biology.....5	BI 102 Plant Biology.....5	BI 103 Animal Biology.....5
CH 103 Fund. Chem. & Lab.....5	CH 104 Fund. Chem. & Lab.....5	MH 162 An. Geom. & Cal.....5
MH 160 Pre-Cal. & Trig.....5	MH 161 An. Geom. & Cal.....5	CH 207 Organic Chem. & Lab.....5
PE 101 Physical Education.....1	PE 102 Physical Education.....1	PE 103 Physical Education.....1
Basic ROTC†.....1	Basic ROTC†.....1	Basic ROTC†.....1
SOPHOMORE YEAR		
ZY 300 Genetics.....5	AEC 202 Ag. Economics.....5	BY 306 Plant Physiology.....5
PS 205 Intr. Physics.....5	AY 304 General Soils.....5	BY 300 Microbiology.....5
EH 101 English Comp.....3	EH 102 English Comp.....3	EH 103 English Comp.....3
HY 101 World History.....3	HY 102 World History.....3	HY 103 World History.....3
Basic ROTC†.....1	Basic ROTC†.....1	Basic ROTC†.....1
JUNIOR YEAR		
ZY 304 General Entomology.....5	AY 200 Crop Prod.....5	BY or AY 321 Herb. Action.....3
BY 309 Gen. Plant Pathol.....5	BY 550 Meth. Plant Path.....4	BY 552 Soil-Seed Diseases.....4
BY 320 Weed ID and Ecol.....3	AY, BY or ZY 403 Pesticides.....5	ZY 405 Applied Entomology.....5
Elective.....5	Elective.....5	SC 202 App. Sp. Comm.....3
		Elective.....3
SENIOR YEAR		
AY 312 Princ. Weed Sci.....3	AY 422 Fact. Limiting Crop Prod.....3	AY BY or ZY 407 Concepts of Pest Management.....5
BY 551 Fol. Har. Stor. Disease.....3	ZY 306 Prin. of Ecology.....5	Electives.....13
ZY 406 Insect Pest Mgt.....5	Electives.....10	
AY 399 Prob. Weed Sci.....1		
Elective.....5		

†Students may select 6 hours of electives approved by their adviser and dean in lieu of Basic ROTC.

School of Architecture and Fine Arts

E. KEITH MCPHEETERS, *Dean*

THE SCHOOL OF ARCHITECTURE AND FINE ARTS includes the Departments of Architecture, Art, Building Science, Industrial Design, Music and Theatre.

The Departments of Architecture and Building Science offer undergraduate degree curricula in Architecture, Interior Design, Landscape Architecture, and Building Science. The objective of these programs is to educate professional practitioners for many aspects of the designed physical environment.

The Departments of Art, Industrial Design, Music and Theatre offer curricula in Visual Arts, Industrial Design, Music and Theatre. The Departments of Art, Music, and Theatre cooperate with the School of Education in the education of teaching professionals. The objective of these programs is to develop creative and professionally knowledgeable practitioners and teachers in the arts and to provide a foundation for continuing professional development.

Graduate degrees are offered in Art, Music, Industrial Design, and Regional Planning. For details see the *Graduate School Bulletin*.

Department Of Architecture

The Department of Architecture was established in 1907 and is the oldest in the South. Courses are offered leading to the non-professional degree Bachelor of Science and the professional degree Bachelor of Architecture, (Architectural Design Option or Architectural Management Option), Bachelor of Landscape Architecture, Bachelor of Interior Design, and Master of Regional Planning.

Admission

Acceptance for admission to the professional curricula in architecture, landscape architecture, regional planning, and interior design, will be determined on the basis of an evaluation of the candidate's test scores and academic records.

Transfer

Transfer students from non-architectural programs will be required to begin the Design sequence at AR 110. Transfer students from accredited schools of Architecture will be required to present examples of their work for evaluation by the Design Co-ordinators Committee. The Committee will determine the level at which the student will enter the Design Sequence.

Design Course Standards

Any student receiving a grade below "C" in AR 201, 202, or 203 shall be reviewed at the end of the second year for a decision on continuation in the design program. Any student in design above the second year level who receives a grade below "C" on the second attempt in a design course will be subject to being dropped from the program.

Architecture

The Curriculum in Architecture prepares the student to take his place as a citizen and as a professional. Since the building industry is one of the three largest in the nation in terms of expenditure and employment, the architect today must accept a concern for the improvement of the physical design of the environment and assume the leadership in evolving effective procedures toward this end. Therefore, the architect must bring to his work technical knowledge, social insight, creative imagination, and individual integrity.

The Bachelor of Science (a non-professional degree) is awarded upon successful completion of the first four years of the curriculum in Architecture. The Bachelor of Architecture (the professional degree) is awarded upon completion of the fifth year in either the Architectural Design or Architectural Management options.

The Department is a member of the Association of Collegiate Schools of Architecture, and the curriculum in Architecture is accredited by the National Architectural Accrediting Board. The Architecture curriculum prepares the student for the office experience and the examination required by the registration laws to practice architecture as well as for examination by the National Council of Architectural Registration Boards.

Student work may be retained by the Department for indefinite periods to be used for exhibition or for record purposes.

The Cooperative Education Program is also offered. For more information, refer to page 53.

Curriculum in Architecture (AR)

FIRST YEAR			SECOND YEAR			THIRD YEAR		
First Quarter			Second Quarter			Third Quarter		
AR 110	Design Fund.....	5	AR 111	Design Fund.....	5	AR 112	Design Fund.....	5
MH 160	Pre. Cal. w/Trig.....	5	MH 161	An. Geom. & Cal.....	5	MH 162	An. Geom. & Cal.**.....	5
EH 101	English Comp.....	3	EH 102	English Comp.....	3	EH 103	English Comp.....	3
HY	Elective*.....	3	HY	Elective*.....	3	HY	Elective.....	3
PE	Elective.....	1	PE	Elective.....	1	PE	Elective.....	1
SECOND YEAR			THIRD YEAR			FOURTH YEAR		
AR 201	Arch. Design.....	5	AR 202	Arch. Design.....	5	AR 203	Arch. Design.....	5
PS 205	Intr. Physics I.....	5	PS 206	Intr. Physics II.....	5	BSC 211	Mech. of Structures.....	5
AR 261	Hist. & Theo. Arch.....	3	BSC 304	Constr. Systems.....	3	BSC 202	Matrls. of Const.....	5
SY 201	Intr. to Sociology.....	5	AR 262	Hist. & Theo. Arch.....	3	AR 263	Hist. & Theo. Arch.....	3
AR 301	Arch. Design.....	5	AR 302	Arch. Design.....	5	AR 303	Arch. Design.....	5
BSC 311	Strgth. of Matl.....	5	BSC 314	Reinf. Concrete.....	5	BSC 315	Applied Struc.....	5
AR 350	20th Century Arch.....	3	BSC 452	Building Equip. I.....	3	BSC 453	Building Equip. II.....	3
	Elective***.....	5	EC 206	Socio. Econ.....	3		Elective.....	3
				Elective***.....	3			

FOURTH YEAR

AR 401 Arch. Design.....5	AR 402 Arch. Design.....5	AR 403 Arch. Design.....5
MN 310 Prin. Manag.....5	AR 475 Urban Design.....3	EH 304 Technical Writing.....3
AR 474 Intr. Urb. Plan.....3	AR Seminar.....3	AR Seminar.....3
Elective***.....5	Elective***.....3	Elective***.....3
	Elective***.....3	Elective***.....3

BACHELOR OF SCIENCE
TOTAL—208 QUARTER HOURS

*History Electives shall follow a sequence and may be chosen from the following: World History (HY 101, 102, 103), or Technology and Civilization (HY 204, 205, 206).

**MH 162 or ACF 215 Fund. of Gen. and Cost Accounting (5)

***See Bulletin for University elective requirements.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives. One seminar will be chosen from each of four of the following categories. Consult department for specific offerings in each category.

- AR 451 Seminars in Methods and Process
- AR 452 Seminars in Contemporary Issues
- AR 453 Seminars in Interdisciplinary Studies
- AR 456 Seminars in Historical Perspectives
- AR 457 Seminars in Aspects of Design
- AR 458 Seminars in Disciplines of Environmental Design

ARCHITECTURAL PROFESSIONAL OPTIONS

Architectural Design Option

First Quarter		FIFTH YEAR		Second Quarter		Third Quarter	
AR 465 Arch. Design.....8		AR 466 Arch. Design.....8		AR 467 Arch. Design.....8		AR 467 Arch. Design.....8	
AR 471 Prof. Practice.....3		AR 499 Design Research.....2		AR Seminar.....3		AR Seminar.....3	
AR Elec. or AR Seminar.....3		AR 472 Prof. Practice.....3		AR Elec. or AR Seminar.....3		AR Elec. or AR Seminar.....3	
AR Seminar.....3							

BACHELOR OF ARCHITECTURE
TOTAL—257 QUARTER HOURS

ARCHITECTURAL MANAGEMENT OPTION

AR 485 Arch. Manag.....5	AR 486 Arch. Manag.....5	AR 487 Arch. Manag.....8
AR 472 Prof. Practice.....3	MN 242 Bus. Law II.....4	AR Seminar.....3
MN 241 Bus. Law I.....4	MN 346 Org. Behavior.....5	AR Elec. or AR Seminar.....3
AR Seminar.....3	AR 472 Prof. Practice.....3	AR Elec. or AR Seminar.....3

BACHELOR OF ARCHITECTURE
TOTAL—257 QUARTER HOURS

Interior Design

The curriculum in Interior Design seeks to prepare the student to take his place as a professional specialist in the design of interior space. As such, he expects to assume a responsible role among those who shape the physical environment. His primary interest in the development of the interiors lies with the social, historical and technical implications of the development of interior space, surface and material.

Curriculum in Interior Design (ID)

FIRST YEAR		FIRST YEAR		FIRST YEAR	
First Quarter		Second Quarter		Third Quarter	
AR 110 Design Fund.....5	AR 111 Design Fund.....5	AR 112 Design Fund.....5		AR 112 Design Fund.....5	
EH 101 English Comp.....3	EH 102 English Comp.....3	EH 103 English Comp.....3		EH 103 English Comp.....3	
AT 171 Hist. World Art.....3	AT 172 Hist. World Art.....3	AT 173 Hist. World Art.....3		AT 173 Hist. World Art.....3	
MH 140 College Algebra.....5	MH 161 An. Geom. & Cal.*.....5	PG 211 Psychology.....5		PG 211 Psychology.....5	
PE Physical Education.....1	PE Physical Education.....1	PE Physical Education.....1		PE Physical Education.....1	

SECOND YEAR

AR 201	Arch. Design	5	AR 202	Arch. Design	5	AR 203	Arch. Design	5
ID 215	Elements of I.D.	3	ID 216	Elements of I.D.	3	ID 217	Elements of I.D.	3
AR 261	Hist. & Theo. Arch.	3	AR 262	Hist. & Theo. Arch.	3	AR 263	Hist. & Theo. Arch.	3
	Nat. Sci. Elective	5	EH 304	Tech. Writing*	3	SY 201	Sociology	5

THIRD YEAR

ID 305	Interior Design.....	5	ID 306	Interior Design.....	5	ID 307	Interior Design.....	5
ID 365	Period Int.....	5	ID 366	Period Interiors.....	5	ID 367	Contemp. Int.....	5
AR 469	Lighting.....	3	MN 310	Prin. Manag.....	5	ID 495	Special Probs.....	3
AR 350	20th Century Arch.....	3	BSC 304	Constru. Systems.....	3		Elective.....	3
	Elective.....	3						

FOURTH YEAR

ID 405	Interior Design	5	ID 406	Interior Design	5	ID 407	Int. Design (Thesis)	7
ID 441	Prof. Prac.	3	ID 408	Int. Design Res.	2		Elective	5
	Elective	5		Creative Crafts,			Elective	3
	Elective	5		Textile Design, Weaving,				
				or Photography	3			
			ID 442	Prof. Prac.	3			
				Elective	5			

BACHELOR OF INTERIOR DESIGN

TOTAL-206 QUARTER HOURS

*MH 161 or ACF 215 Fund. of Gen. and Cost Accounting (5).

**EH 304 or SC 202 Appl. Speech Comm. (3) or SC 211 Public Speaking (5).

AT 371, 372, or 373, Art History may be substituted for AT 171, 172 or 173

Two months of practical experience with a professional interior designer is recommended between the third and fourth year.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours general electives.

Landscape Architecture

Landscape Architecture is the planning and design of land and water for optimum human use and enjoyment. In its growth, the profession has evolved to include a wide range of activities from a strong involvement with small scale physical design to the need for regional scale environmental analysis and natural resource planning.

Sound preparation for a career in Landscape Architecture requires a thorough professional education, therefore, the curriculum draws from the realms of Nature and Man, Art, and Technology for its strength. The curriculum addresses itself to the Landscape Architect's role in understanding and balancing the relationship between human enterprise and the natural environment.

The Bachelor of Science degree (a non-professional degree) is awarded upon successful completion of the first four years of the curriculum in Landscape Architecture. The Bachelor of Landscape Architecture degree (the professional degree) is awarded upon the successful completion of the fifth year of study. The total curriculum prepares the student for professional practice, as well as for the national and state registration examinations.

Curriculum in Landscape Architecture (LA)

FIRST YEAR

First Quarter			Second Quarter			Third Quarter		
AR 110	Design Fund.	5	AR 111	Design Fund.	5	AR 112	Design Fund.	5
MH 160	Pre Cal. w/Trig	5	MH 161	An. Geom. & Cal.	5	CE 201	Surveying	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History*	3	HY 102	World History*	3	HY 103	World History*	3
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SECOND YEAR

AR 201 Arch. Design.....5	AR 202 Arch. Design.....5	AR 203 Arch. Design.....5
LA 231 Intr. Land. Arch.....3	LA 232 Dev. Land. Arch. I.....3	LA 233 Dev. Land. Arch. II.....3
BI 101 Prin. of Biology.....5	BI 102 Plant Biology.....5	HF 321 Decid. Sh. & Vines.....5
HF 222 Trees.....5	HF 223 Everg. Sh. & Vines.....5	GY 214 Phys. Geog.....5

THIRD YEAR

LA 321 Basic L.A. Design.....5	LA 322 Basic L. A. Design.....5	LA 323 Basic L. A. Design.....5
PS 205 Physics.....5	LA 341 Lands. Const. I.....5	LA 342 Lands. Const. II.....5
SY 201 Intr. Sociology**.....5	EC 206 Socio-Economics.....3	PG 211 Psychology.....5
Elective.....3	Elective.....3	EH 304 Tech. Writing.....3

FOURTH YEAR

LA 421 Int. Lands. Design.....5	LA 422 Int. Lands. Design.....5	LA 423 Int. Lands. Design.....5
SC 401 Psych. of Commun.....5	LA 431 Adv. Plant. Comp.....5	LA 446 Prof. Practice I.....5
AR 474 Intr. Urb. Plng.....3	EH 475 Urban Design.....3	LA 495 Special Problems.....3
Elective.....3	Elective.....3	Elective.....3

BACHELOR OF SCIENCE

TOTAL—205 QUARTER HOURS

FIFTH YEAR

LA 451 Adv. Lands. Design.....8	LA 452 Adv. Lands. Design.....8	LA 453 Adv. Lands. Design.....8
LA 447 Prof. Practice II.....3	LA 450 Design Research.....2	LA 455 Lands. Arch. Seminar.....5
Elective.....5	Elective.....3	Elective.....3
	Elective.....3	

BACHELOR OF LANDSCAPE ARCHITECTURE

TOTAL—253 QUARTER HOURS

*HY 101, 102, 103 or Technology and Civilization (HY 204, 205, 206).

** SY 201 or Rural Sociology (RSY 261).

Department Of Art

The Visual Arts curriculum trains students to become professional practitioners as artist-teachers, graphic designers, illustrators, advertising artists, art directors, painters, sculptors, printmakers, etc. It leads to the Bachelor of Fine Arts degree, and its program of studio courses is combined with studies of the function and historical background of the visual arts. Courses in general education promote in students a comprehension of their responsibilities to their society and culture. A sound program of fundamental courses in drawing, design, painting, and three-dimensional expression precede advanced courses in which students work with a maximum of independence under the guidance of qualified instructors.

The Visual Arts curriculum may be divided into three general categories: academic courses, studio courses and courses in art history. Studio courses are divided into three progressive group levels. The first year is made up of visual art fundamentals. The second and third years contain classes in basic traditional media in which the student learns technical procedures and develops the disciplines necessary to express himself fully in the third and fourth year areas of concentration. The third and fourth year areas include drawing, painting, printmaking, sculpture, visual design and illustration.

The Visual Communications program gives fundamental training in the techniques of graphic design and related areas of visual communication. It is strongly reinforced with courses in painting, drawing, printmaking, sculpture and art history. Students preparing themselves as practicing artists or artist-teachers may concentrate entirely upon the offerings in the traditional fine arts media. Students planning to teach at the college level need to secure a Master of Fine Arts degree at this or another institution.

The department also offers courses for education majors specializing in art, and for students in other fields who seek general knowledge and appreciation of the visual arts. Students in the School of Arts and Sciences may elect a minor (15 hours), a double minor (30 hours), or B.A. with art major (See page 91).

The Department of Art is an accredited member of the National Association of Schools of Art, and a member of the College Art Association.

Transfer

All course work to be considered for transfer credit should be the equivalent of work required in the Visual Arts curriculum at Auburn. Art studio course credit earned (C or better) will be considered for advanced standing if a complete portfolio of work is submitted to the Auburn Art Department for evaluation. If the examples do not approximate Auburn's requirements, then credit may be given for an art studio elective. If the quality of work is not acceptable, credit may be given for an open elective.

Graduate Study in Fine Arts

Students who hold the degree of Bachelor of Fine Arts, or a similar degree, are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Fine Arts degree. For details examine the *Graduate School Bulletin*.

Curriculum in Visual Arts (VAT)

FIRST YEAR			
First Quarter		Second Quarter	
AT 111	Fundamentals.....5	AT 112	Fundamentals.....5
AT 121	Fundamentals.....5	AT 122	Fundamentals.....5
AT 171	Hist. of World Art.....3	AT 172	Hist. of World Art.....3
EH 101	English Comp.....3	EH 102	English Comp.....3
PE	Physical Education.....1	PE	Physical Education.....1
Third Quarter			
AT 113	Fundamentals.....5	AT 123	Fundamentals.....5
AT 173	Hist. of World Art.....3	AT 173	Hist. of World Art.....3
EH 103	English Comp.....3	EH 103	English Comp.....3
PE	Physical Education.....1	PE	Physical Education.....1
SECOND YEAR			
AT	Group A Studio.....5	AT	Group A Studio.....5
AT	Group A Studio.....5	AT	Group A Studio.....5
	Natural Science.....5	AT	Group A Studio.....5
	Math/Philosophy.....3		Natural Science.....5
			Elective.....3
THIRD YEAR			
AT	Group A Studio.....5	AT	Group A Studio.....5
AT	Group A Studio.....5	AT	Group B Studio.....5
	Natural Science.....5	AT	Group A or B Stdo.....5
AT	Group I AT HY.....3	AT	Nat. or Soc. Sci.....5
		AT	Group II AT HY.....3
		AT	Group III AT HY.....3
FOURTH YEAR			
AT	Group B Studio.....5	AT	Group B Studio.....5
AT	Group A or B Studio.....5	AT	Group A or B Studio.....5
AT	Elective.....5	AT	Elective.....5
	Elective.....3	AT	Elective.....5
		AT	Elective.....5

TOTAL—210 QUARTER HOURS

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

GROUP A STUDIO

Prerequisites: AT 113, 123, 171, 172, and 173 (or by special permission).

Figure Drawing		Visual Communications	
AT 211	Basic Figure Drawing	AT 221	Graphic Processes
AT 212	Figure Construction	AT 222	Design Systems
AT 213	Figure Drawing	AT 223	Graphic Formats
AT 221	Photodesign	AT 321	Photodesign
AT 222	Photocommunication	AT 322	Photocommunication
AT 223	Typographics	AT 323	Typographics
Painting		Printmaking	
AT 231- 331	Oil Painting	AT 241- 341	Relief Printmaking
AT 232- 332	Transp. Wtr. Color	AT 242- 342	Intaglio Printmaking
AT 233- 333	Opaque Wtr. Color	AT 243- 343	Planographic Printmaking
		Sculpture	
AT 251- 351	Modeling/Construction	AT 251- 351	Modeling/Construction
AT 252- 352	Wood Sculpture	AT 252- 352	Wood Sculpture
AT 253- 353	Stone Sculpture	AT 253- 353	Stone Sculpture

GROUP B STUDIO

Areas of concentration are followed by their prerequisites.

AT 424, 425-426	Visual Design 1, 2, 3	2.0	Average in Group A Drawing and Visual Communications
AT 434, 435-436	Advanced Painting/Drawing 1, 2, 3	2.0	Average in Group A Drawing and Painting
AT 444, 445-446	Advanced Printmaking 1, 2, 3	2.0	Average in Group A Drawing and Printmaking
AT 454, 455-456	Advanced Sculpture 1, 2, 3	2.0	Average in Group A Drawing and Sculpture
AT 464, 465-466	Illustration 1, 2, 3	2.0	Average in Group A Drawing, Visual Communications, AT 232.

ART HISTORY

Prerequisite: Sophomore Standing.

Group I		Group II		Group III	
AT 371	Ancient Egyptian & Near Eastern Art.....3	AT 374	Late Goth. Art In N. Europe & Spain.....3	AT 377	Baroque & Rococo Art.....3
AT 372	Art of the Classical Age.....3	AT 375	Ital. Renais. Art.....3	AT 378	Early Mod. Art.....3
AT 373	Medieval Art.....3	AT 376	Late Renais. & Mannerist Art.....3	AT 379	Late Mod. Art.....3

Department Of Building Science

The purpose of the curriculum in Building Science (formerly Building Technology) is to develop professionally knowledgeable practitioners and managers for a wide variety of roles in the construction industry.

The Department of Building Science offers courses in the design of structural and mechanical systems for buildings, construction procedures, building cost estimation and construction management. The curriculum leads to the degree of Bachelor of Science in Building Construction.

Curriculum in Building Science (BSC)

FIRST YEAR			THIRD QUARTER		
First Quarter			Second Quarter		
MH 160	Pre-Cal. w. Trig.....5	MH 161	An. Geom. & Cal.....5	MH 162	An. Geom. & Cal.***.....5
BSC 100	Drawing & Proj.....2	BSC 101	Intr. to Building.....4	BSC 202	Mtls. of Constr.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 204	Tech. & Civil.....3	HY 205	Tech. & Civil.....3	HY 206	Tech. & Civil.....3
PE	Physical Education.....1	PE	Physical Education.....1	PE	Physical Education.....1
	Elective**.....1		Elective**.....1		
SECOND YEAR			THIRD YEAR		
EC 200	Gen. Economics.....5	BSC 211	Mech. of Struct.....5	BSC 311	Strength of Mtls.....5
PS 205	Physics.....5	PS 206	Physics.....5	ACF 212	Intr. Acct.....4
BSC 261	Hist. of Bldg. I.....3	ACF 211	Intr. Acct.....4		Computer Elective.....3
SC 202	App. Sp. Comm.....3	BSC 262	Hist. of Bldg. II.....3		Elective.....5

THIRD YEAR			
BSC 314	Reinforced Concrete	5	
BSC 304	Constr. Systems	3	
BSC 324	Constr. Surveying	3	
EH 304	Tech. Writing	3	
	Elective	5	
BSC 315	Appld. Struct.	5	
BSC 323	Fndatns. & Soils	3	
BSC 491	Leg. Asp. Engr.	3	
	Arch. & Design	3	
	Tech. Elective	8	
FOURTH YEAR			
BSC 405	Contracting Bus. I	3	
BSC 431	Constr. Estim. II	3	
BSC 453	Bldg. Equip. II	3	
	Electives	10	
BSC 434	Constr. Schldg.	5	
BSC 406	Contracting Bus. II	3	
	Tech. Electives	11	
BSC 321	Constr. Estim. I	5	
MN 500	Ind. Relations	5	
BSC 340	Constr. Safety	3	
BSC 452	Bldg. Equip. I	3	
BSC 325	Formwk. Design	3	
BSC 490	Terminal Project	8	
	Tech. Elective	5	

TOTAL—207 QUARTER HOURS

*HY 101, 102, 103 may be substituted for HY 204, 205, 206.

**U201 Forum, Basic ROTC, or other elective.

***CH 101, 102, 103L may be substituted for MH 162.

BSC course numbers with a zero in the middle (101, 202, etc.) are core courses for BSC students and must be taken in sequence.

Technical Electives must be selected from lists approved by the Department. Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for SC 202 and 9 hours of general electives.

Department of Industrial Design

Industrial Design is concerned primarily with the practical and aesthetic relation of products and systems to those who use them. The Industrial Designer as a leading member of a research and development team—composed of engineers, scientists, and designers—is responsible for the product's shape, color, proportion, and texture, or for the optimum interaction between man and technology in a system. He is deeply concerned with such factors of use as efficiency, convenience, safety, comfort, maintenance, and cost.

The Industrial Designer's activity encompasses areas such as product design, transportation design, industrialized building, package design, exhibition design, and systems design.

The student of Industrial Design learns, for example, the basic principles of design, engineering, human factors designing, marketing, and sociology. He acquires such technical skills as drafting, model-making, photography and sketching techniques. He is introduced to design methods, product planning, visual statistics, materials, manufacturing methods, consumer psychology, and environmental studies.

The four-year curriculum leads to the professional degree of Bachelor of Industrial Design. The program is approved by the Industrial Designers Society of America. Graduates will qualify for positions in industrial design consultant offices and in various industries.

The Cooperative Education Program is also offered. (See Cooperative Education section.)

Curriculum in Industrial Design (IND)

FRESHMAN YEAR			
First Quarter		Second Quarter	
MH 140	College Algebra	5	
EH 101	English Comp.	3	
HY 204	Tech. & Civilization	3	
TS 102	Graphic Comm. & Des	2	
TS 111	Woodworking	1	
PE	Physical Education	1	
Third Quarter		Fourth Quarter	
BI 101	Prin. of Biology	5	
EH 103	English Comp.	3	
HY 206	Tech. & Civilization	3	
TS 105	Engr. Drawing II	2	
TS 114	Sheetmetal Design	1	
TS 115	Foundry Tech.	1	
PE	Physical Education	1	

SOPHOMORE YEAR

IND 210 Industrial Design.....6	IND 211 Industrial Design.....6	IND 212 Industrial Design.....6
IND 221 Materials & Tech.....5	IND 222 Tech. Illustration.....5	IND 223 Ind. Design Met.....5
PG 212 Psychology.....3	EC 200 Economics I.....5	PS 200 Fnds. of Physics.....5
	Elective.....3	TS 204 Kinematics of Mach.....3

JUNIOR YEAR

IND 310 Industrial Design.....6	IND 311 Industrial Design.....6	IND 312 Industrial Design.....6
IND 309 Design Comm.....5	IND 308 Design Workshop.....5	IND 307 Anthropometry.....5
TS 308 Gauges & Meas.....5	Elective.....5	MT 331 Prin. of Mkt.....5
	AT Art History Elective.....3	Elective.....3

SENIOR YEAR

IND 410 Industrial Design.....5	IND 411 Industrial Design.....5	IND 412 Ind. Design Thesis.....5
IND 415 Hy. of Ind. Design.....5	IND 586 Case Studies in Design.....5	IND 585 Seminar in Ind. Des.....5
PG 561 Industrial Psych.....5	PG 590 Design Psych.....3	SY 508 Ind. Sociology.....5
	Elective.....3	

BACHELOR OF INDUSTRIAL DESIGN**TOTAL—207 QUARTER HOURS**

Electives must come from the list of courses approved by the Department.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Students who hold a bachelor's degree are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Industrial Design degree. For details see the *Graduate School Bulletin*.

Department Of Music

The Department of Music provides instruction and performing experience to students interested in developing their talents in music. The courses of study provided by the Department have been created to present a balance between creative skills and academic studies, allowing at the same time a certain flexibility to meet individual requirements.

The Department of Music offers the Music major a professional curriculum leading to the Bachelor of Music degree, with majors in (a) Applied Music, (b) Theory and Composition, (c) Church Music, or (d) Piano Pedagogy. These programs provide preparation for the professional field of performance and for private or college teaching of applied music, theory, and composition. They also provide training for church organists and choir directors.

For the student wishing to major in Music History and Literature, the Department of Music offers a program of studies leading to the Bachelor of Arts degree. This is a cultural, not a professional, degree.

Courses in applied music are available to all University students in band and orchestral instruments, voice, piano, and organ. Performance groups, such as the Marching and Concert Bands, Orchestra, University Singers, Concert Choir, Choral Union, Opera Workshop, and various instrumental ensembles, are also available to students in all curricula.

In each curriculum option six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

Professional Curriculum in Music (MU)

(A) Applied Music Major

			FIRST YEAR					
First Quarter			Second Quarter			Third Quarter		
MU 131	Mat. & Org. Music	5	MU 132	Mat. & Org. Music	5	MU 133	Mat. & Org. Music	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
MU 181	Applied Music	3	MU 182	Applied (major)	3	MU 183	Applied (major)	3
	(major)	3	MU 188	Applied (minor)	1	MU 189	Applied (minor)	1
MU 187	Applied Music	1	MU	Perf. Group	1	MU	Perf. Group	1
	(minor)	1	PE	Physical Education	1	PE	Physical Education	1
PE	Physical Education	1	MU 100	Convocation	0	MU 100	Convocation	0
MU 100	Convocation	0						
MU	Perf. Group	1						
			SECOND YEAR					
MU 231	Mat. & Org. Music	5	MU 232	Mat. & Org. Music	5	MU 233	Mat. & Org. Music	5
	Natural Science	5		Natural Science	5	MH 100	Mathematics	5
MU 281	Applied Music	3	MU 282	Applied (major)	3	MU 283	Applied (major)	3
	(major)	3	MU 288	Applied (minor)	1	MU 289	Applied (minor)	1
MU 287	Applied Music	1	MU	Perf. Group	1	MU	Perf. Group	1
	(minor)	1	MU	Ensemble	1	MU	Ensemble	1
MU	Perf. Group	1	MU 100	Convocation	0	MU 100	Convocation	0
MU	Ensemble	1		Elective	3		Elective	3
MU 100	Convocation	0						
			THIRD YEAR					
MU 331	Mat. & Org. Music	5	MU 332	Mat. & Org. Music	5	MU 333	Mat. & Org. Music	5
MU 361	Conducting	3	PA 210	Philosophy	3	PA 214	Philosophy	3
MU 351	Music History	3	MU 352	Music History	3	MU 353	Music History	3
MU 381	Applied Music	3	MU 382	Applied (major)	3	MU 383	Applied (major)	3
	(major)	3	MU	Ensemble	1	MU 100	Convocation	0
MU	Ensemble	1	MU 100	Convocation	0		Elective (Social or	3
MU 100	Convocation	0		Elective (Social or	3		Nat. Sci.)	3
	Elective (Social or	3		Nat. Sci.)	3			
	Nat. Science)	3						
			FOURTH YEAR					
FL	Foreign Language	5	FL	Foreign Language	5	FL	Foreign Language	5
MU 481	Applied Music	3	MU 482	Applied (major)	3	MU 483	Applied (major)	3
	(major)	3	MU	Pedagogy	3	MU	Ensemble	1
MU 337	Modern Harmony	3	MU	Ensemble	1	MU 363	Conducting	1
MU	Ensemble	1	MU 362	Conducting	1	MU 100	Convocation	0
MU 100	Convocation	0	MU 100	Convocation	0		Elective	3
	Elective (Social or	6		Elective	3			
	Nat. Sci.)	6						

TOTAL—205 QUARTER HOURS

(B) Theory and Composition Major

FIRST YEAR			SECOND YEAR			THIRD YEAR		
First Quarter			Second Quarter			Third Quarter		
MU 131	Mat. & Org. Music	5	MU 132	Mat. & Org. Music	5	MU 133	Mat. & Org. Music	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
MU 184	Applied Music	1	MU 185	Applied Music	1	MU 186	Applied Music	1
MU 116	Woodwind Instr.	1	MU 117	Woodwind Instr.	1	MU 118	Woodwind Instr.	1
MU 110	String Instr.	1	MU 111	String Instr.	1	MU 112	String Instr.	1
PE	Physical Education	1	MU	Perf. Group	1	MU	Perf. Group	1
MU 100	Convocation	0	PE	Physical Education	1	PE	Physical Education	1
			MU 100	Convocation	0	MU 100	Convocation	0
							Elective	3
SECOND YEAR			THIRD YEAR			FOURTH YEAR		
MU 231	Mat. & Org. Music	5	MU 232	Mat. & Org. Music	5	MU 233	Mat. & Org. Music	5
	Natural Science	5		Natural Science	5	MH 100	Mathematics	5
MU 284	Applied Music	1	PG 212	Psychology	3	MU 286	Applied Music	1
MU 113	Brass Instr.	1	MU 285	Applied Music	1	MU 115	Brass Instr.	1
MU 107	Voice Class	1	MU 114	Brass Instr.	1	MU 119	Percussion Instr.	1
	Social Science Elect.	3	MU 108	Voice Class	1	MU	Perf. Group	1
MU	Perf. Group	1	MU	Perf. Group	1	MU	Ensemble	1
MU	Ensemble	1	MU	Ensemble	1	MU 100	Convocation	0
MU 100	Convocation	0	MU 100	Convocation	0			

MU 331	Mat. & Org. Music	5
MU 351	Music History	3
MU 337	Modern Harmony I	3
MU 437	Orchestration	3
MU 384	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective (Social or Nat. Science)	3

MU 332	Mat. & Org. Music	5
MU 352	Music History	3
MU 338	Modern Harm. II	3
MU 438	Orchestration	3
MU 385	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective (Social or Nat. Science)	3

MU 333	Mat. & Org. Music	5
MU 353	Music History	3
MU 339	Modern Harm. III	3
MU 386	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
MU 439	Orchestration	3
	Elective (Social or Nat. Science)	3

FL	Foreign Language	5
MU 434	Music Comp.	3
MU 484	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective	6
	Elective (Social or Nat. Science)	3

FL	Foreign Language	5
MU 435	Music Comp.	3
MU 485	Applied Music	1
MU 445	Theory Pedagogy	3
MU	Perf. Group	1
MU 100	Convocation	0
	Elective	3

FL	Foreign Language	5
MU 436	Music Comp.	3
MU 486	Applied Music	1
MU	Perf. Group	1
MU 100	Convocation	0
	Elective	3

TOTAL—206 QUARTER HOURS

(C) Church Music Major

MU 131	Mat. & Org. Music	5
EH 101	English Comp.	3
HY 101	World History	3
MU 181	Applied Music (major)	3
MU 187	Applied Music (minor)	1
MU	Ensemble	1
PE	Physical Education	1
MU 100	Convocation	0

MU 132	Mat. & Org. Music	5
EH 102	English Comp.	3
HY 102	World History	3
MU 182	Applied (major)	3
MU 188	Applied (minor)	1
MU	Ensemble	1
PE	Physical Education	1
MU 100	Convocation	0

MU 133	Mat. & Org. Music	5
EH 103	English Comp.	3
HY 103	World History	3
MU 183	Applied (major)	3
MU 189	Applied (minor)	1
MU	Ensemble	1
PE	Physical Education	1
MU 100	Convocation	0

MU 231	Mat. & Org. Music	5
MU 281	Applied Music (major)	3
MU 287	Applied Music (minor)	1
MU	Ensemble (or MU 211)	1
MU 100	Convocation	0
	Elective	3

MU 232	Mat. & Org. Music	5
MU 282	Applied (major)	3
MU 288	Applied (minor)	1
MU	Ensemble (or MU 212)	1
MU 100	Convocation	0
	Elective	3

MU 100	Mathematics	5
MU 233	Mat. & Org. Music	5
MU 283	Applied (major)	3
MU 289	Applied (minor)	1
MU	Ensemble	1
MU 100	Convocation	0
	Elective	3

MU 331	Mat. & Org. Music	5
PA 214	Philosophy	3
MU 351	Music History	3
MU 381	Applied Music (major)	3
MU 312	Hymnology	3
MU	Ensemble	1
MU 100	Convocation	0

MU 332	Mat. & Org. Music	5
PA 214	Philosophy	3
MU 352	Music History	3
MU 382	Applied (major)	3
MU 311	Liturgies	3
MU	Ensemble	1
MU 100	Convocation	0

MU 333	Mat. & Org. Music	5
MU 353	Music History	3
MU 383	Applied (major)	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective	6

FL	Foreign Language	5
MU 361	Conducting	3
MU 481	Applied Music (major)	3
MU	Ensemble	1
MU 100	Convocation	0
	Elective (Social or Nat. Sci.)	6

FL	Foreign Language	5
MU 415	Organ Lit. or Vocal Pedagogy	3
MU 482	Applied (major)	3
MU 362	Conducting	1
MU	Ensemble	1
MU 100	Convocation	0
	Elective (Social or Nat. Sci.)	3
	Elective	2

FL	Foreign Language	5
MU 416	Church Music Seminar	3
MU 483	Applied (major)	3
MU 453	Choral Lit.	3
MU	Ensemble	1
MU 100	Convocation	0

TOTAL—210 QUARTER HOURS

(D) Piano Pedagogy Major**FIRST YEAR**

First Quarter		
EH 101	English Comp.	3
HY 101	World History	3
MU 131	Mat. & Org. Music	5
MU 184	Applied Piano	1
MU 100	Convocation	0
PE	Physical Education	1
MU 251	Surv. Music Lit.	1
MU 327	Piano Ensemble	1
MU 187	Applied Minor	1

Second Quarter		
EH 102	English Comp.	3
HY 102	World History	3
MU 132	Mat. & Org. Music	5
MU 185	Applied Piano	1
MU 100	Convocation	0
PE	Physical Education	1
MU 252	Surv. Music Lit.	1
MU 327	Piano Ensemble	1
MU 188	Applied Minor	1

Third Quarter		
EH 103	English Comp.	3
HY 103	World History	3
MU 133	Mat. & Org. Music	5
MU 186	Applied Piano	1
MU 100	Convocation	0
PE	Physical Education	1
MU 253	Surv. Music Lit.	1
MU 327	Piano Ensemble	1
MU 189	Applied Minor	1

SECOND YEAR

MU 231	Mat. & Org. Music	5
	Nat. Science	5
MU 284	Applied Piano	1
MU 287	Applied Minor	1
MU 327	Piano Ensemble	1
MU 100	Convocation	0
	Elective	3

MU 232	Mat. & Org. Music	5
	Nat. Science	5
MU 285	Applied Piano	1
MU 288	Applied Minor	1
MU 327	Piano Ensemble	1
MU 100	Convocation	0
	Elective	3

MU 233	Mat. & Org. Music	5
MH 100	Mathematics	5
MU 286	Applied Piano	1
MU 289	Applied Minor	1
MU 327	Piano Ensemble	1
MU 100	Convocation	0
	Elective	3

THIRD YEAR

MU 331	Mat. & Org. Music	5
MU 351	Music History	3
PA 210	Philosophy	3
MU 384	Applied Piano	1
MU 327	Piano Ensemble	1
MU 457	Keyboard Lit.	1
	Soc. or Nat. Science	3
MU 100	Convocation	0

MU 332	Mat. & Org. Music	5
MU 352	Music History	3
PA 214	Philosophy	3
MU 385	Applied Piano	1
MU 327	Piano Ensemble	1
MU 458	Keyboard Lit.	1
	Soc. or Nat. Science	3
MU 100	Convocation	0

MU 333	Mat. & Org. Music	5
MU 353	Music History	3
MU 361	Conducting	3
MU 386	Applied Piano	1
MU 327	Piano Ensemble	1
MU 459	Keyboard Lit.	1
	Soc. or Nat. Science	3
MU 100	Convocation	0

FOURTH YEAR

FL	Foreign Language	5
MU 447	Piano Pedagogy	3
MU 327	Piano Ensemble	1
MU 484	Applied Piano	1
	Soc. or Nat. Science	3
MU 337	Modern Harmony	3
MU 100	Convocation	0

FL	Foreign Language	5
MU 448	Piano Pedagogy	3
MU 327	Piano Ensemble	1
MU 485	Applied Piano	1
	Soc. or Nat. Science	3
	Elective	3
MU 100	Convocation	0

FL	Foreign Language	5
MU 449	Piano Pedagogy	3
MU 327	Piano Ensemble	1
MU 486	Applied Piano	1
	Soc. or Nat. Science	3
	Elective	3
MU 100	Convocation	0

TOTAL—195 QUARTER HOURS**Bachelor of Arts****FIRST YEAR**

First Quarter		
MU 131	Mat. & Org. Music	5
EH 101	English Comp.	3
HY 101	World History	3
MU 184	Applied Music	1
MU	Ensemble	1
PE	Physical Education	1
MU 100	Convocation	0

Second Quarter		
MU 132	Mat. & Org. Music	5
EH 102	English Comp.	3
HY 102	World History	3
PA 211	Philosophy	3
MU 185	Applied Music	1
MU	Ensemble	1
PE	Physical Education	1
MU 100	Convocation	0

Third Quarter		
MU 133	Mat. & Org. Music	5
MH 100	Mathematics	5
EH 103	English Comp.	3
HY 103	World History	3
MU 186	Applied Music	1
MU	Ensemble	1
MU 100	Convocation	0

SECOND YEAR

MU 231	Mat. & Org. Music	5
	Natural Science	5
EH 253	English Lit.	3
MU 284	Applied Music	1
MU	Ensemble	1
PE	Physical Education	1
MU 100	Convocation	0
MU 251	Surv. Mut. Lit.	1

MU 232	Mat. & Org. Music	5
	Natural Science	5
EH 254	English Lit.	3
MU 285	Applied Music	1
MU	Ensemble	1
MU 100	Convocation	0
MU 252	Surv. Mu. Lit.	1

MU 233	Mat. & Org. Music	5
EH 255	English Lit.	3
MU 286	Applied Music	1
MU	Ensemble	1
AT 171	Art History	3
MU 100	Convocation	0
	Elective	5
MU 253	Surv. Mu. Lit.	1

THIRD YEAR

MU 331	Mat. & Org. Music	5
MU 351	Music History	3
MU 384	Applied Music	1
PA 212	Philosophy	3
MU 100	Convocation	0
	Academic Minor*	5

MU 332	Mat. & Org. Music	5
MU 352	Music History	3
MU 385	Applied Music	1
MU 100	Convocation	0
	Academic Minor	5
	Elective (Social or Nat. Science)	3

MU 333	Mat. & Org. Music	5
MU 353	Music History	3
MU 386	Applied Music	1
MU 100	Convocation	0
	Academic Minor	5
	Elective (Social or Nat. Science)	3

FOURTH YEAR

PG 211	Psychology.....3	FL	Foreign Language.....5	FL	Foreign Language.....5
MU 484	Applied Music.....1	MU 361	Conducting.....3	MU 486	Applied Music.....1
FL	Foreign Language.....5	MU 485	Applied Music.....1	MU 100	Convocation.....0
MU 100	Convocation.....0	MU 100	Convocation.....0		Academic Minor.....5
	Academic Minor.....5		Academic Minor.....5		Elective (Social or
	Elective (Social or		Elective (Social or		Nat. Science).....3
	Nat. Science).....3		Nat. Science).....3		

TOTAL—200 QUARTER HOURS

*A minor of 30 quarter hours elected from approved courses.

Keyboard proficiency is required for non-keyboard majors. In such cases three of the applied music credits will be taken in piano.

Supplementary Requirements for Bachelor of Music and Bachelor of Arts Degree Candidates

1. Attendance at student convocations is compulsory. Absences may be excused only by the Head of the Music Department.

2. At the end of the Sophomore year a comprehensive examination will be given which must be passed before the student is admitted to the upper division music courses. Transfer students must complete this examination to receive junior standing.

3. A. Students electing the applied music major will present a junior recital during the third year of study and a senior recital during the fourth year of study.
- B. Students electing the theory and composition major will present an original composition in small form during the third year of study and an original composition in large form during the fourth year of study.
- C. Students electing the history and literature major will present a written thesis during the fourth year of study.
- D. Students electing the church music major will present a senior recital during the fourth year of study.
- E. Students electing the Piano Pedagogy major will present a senior recital during the fourth year of study.

4. Credit in applied music is based on the amount of practice, each credit hour requiring a minimum of five hours practice per week.

5. Students whose major performing medium is not piano or organ will elect piano as the minor instrument.

6. Participation in an approved music performing group is required each quarter, with or without credit. Participation in opera workshop is required of junior and senior voice majors.

7. All students taking applied music will meet public performance requirements as designated by the faculty. (See Music Department special regulations regarding requirements for jury examinations and convocation performances.)

Music Education

Teacher Education: Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Architecture and Fine Arts to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the professional curriculum in music, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued. It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the Department of Music. The advisers will counsel in their respective areas.

Music Organization

Several musical organizations, sponsored by the University and directed by the Department of Music, provide excellent training in group music. See section on musical groups in the student handbook, *Tiger Cub*. These activities, which are open to students of the University, may be taken with or without credit.

Graduate Work in Music

Admission to graduate work toward the Master of Music Degree requires a Bachelor's degree in music, music education, or the equivalent from this or another recognized institution. Admission to graduate study in the Music Department shall be in accordance with policies of the Graduate School. In addition, all candidates must take entrance examinations in music theory and history administered by members of a Departmental Screening Committee, demonstrate competency at the keyboard, and fulfill additional requirements as follows:

Instrumental Majors—Audition

Voice Majors—Audition and demonstration of satisfactory diction in Italian, French, and German.

(See graduate catalogue for details)

Students who hold a baccalaureate degree in Education with a Major in Music are eligible to apply to the Dean of the Graduate School for admission to the graduate courses leading to the degrees Master of Science and Master of Education with Major in Music.

Department of Theatre

The purpose of the Theatre curriculum is to develop knowledgeable and creative practitioners, teachers, and students of theatre art. Theatre is emphasized as a discipline, involving natural talent, study, and practice. To

permit students to explore their personal resources and to develop as total theatre persons, a broad range of classroom, laboratory, and performance experiences are provided in history/criticism, acting/directing, and design/technical production.

Classroom courses and production performances are of equal and complementary value in training individuals who are able to participate enthusiastically in all phases of theatre. Students may best become integrated, proficient craftsmen through learning by doing, and are accordingly encouraged to test knowledge and skills under the pressure of public performance at the Auburn University Theatre.

The Department of Theatre offers four undergraduate degree programs. The preprofessional curriculum in Architecture and Fine Arts leads to the Bachelor of Fine Arts degree and is for those wishing to become actors, designers, and technicians. The liberal arts curriculum in Arts & Sciences leads to the Bachelor of Arts in Theatre for those choosing theatre as a humanistic study (see page 93). Completion of the requirements of the Teacher Education Program and the *Theatre education* major leads to the Bachelor of Science in Education (see page 126).

The interdepartmental program with Business is for those who wish to cover the common body of knowledge required by the American Assembly of Collegiate Schools of Business, along with a full major in theatre, to earn the Bachelor of Science in Business Administration (see page 119).

Students in the School of Arts & Sciences, in addition to a Theatre major, may elect a minor (15 hours) or a double minor (30 hours). Those wishing to minor in Theatre should consult the department head for specific recommendations.

Curriculum in Theatre (TH)

FIRST YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. of Biology	5	BI	104	Bio. of Human Affairs	5	PA	210	Intr. to Philosophy	3
EH	101	English Comp.	3					EH	103	English Comp.	3
HY	101	World History	3	EH	102	English Comp.	3	EH	103	World History	3
TH	104	Intr. to Theatre I	3	HY	102	World History	3	TH	106	Intr. to Theatre III	3
TH	107	Stage Craft I	1	TH	105	Intr. to Theatre II	3			Elective (Social or Nat. Sci.)	3
PE	101	Fund. of Phys. Ed.	1	TH	106	Stage Craft II	1				
TH	100	Convocation	0			Group I	1	TH	109	Stage Craft III	1
				TH	100	Convocation	0	PE		Group II	1
								TH	100	Convocation	0

SECOND YEAR

TH	204	Acting Fund. I	5	TH	205	Acting Fund. II	5	TH	206	Acting Fund. III	5
TH	201	Contemp. Amer. Theatre	3	TH	207	Stage Make-up	3	EH	225	English Lit.	3
PA	216	Philosophies of Man	3	PG	212	Psychology	3	AT	173	Art History	3
EH	253	English Lit.	3	EH	254	English Lit.	3	TH	309	Costume	3
AT	171	Art History	3	AT	172	Art History	3	MU	201, 373, or 374		3
TH	199	Theatre Lab	2	TH	199	Theatre Lab	2	TH	199	Theatre Lab	2
TH	100	Convocation	0	TH	100	Convocation	0	TH	100	Convocation	0

THIRD YEAR

TH	304	Stage Design Fund.	5	EH	361	Hist. of Eng. Drama	5			Elective (Social or Nat. Sci.)	5
		Elective (Social or Nat. Sci.)	5			Elective (Social or Nat. Sci.)	5	TH		Theatre Elective	5
TH	301	Theatre in West. Civilization	3	TH	302	Theatre in West. Civilization	3	TH	306	Theatre Design II or	3
TH	321	Costume History or	3	TH	305	Theatre Design I or	3	TH	323	Costume Patterning	3
TH	326	Stage Lighting	3	TH	322	Costume Design	3	TH	303	Theatre in West. Civilization	3
TH	111	Theatre Practice	1	TH	111	Theatre Practice	1	TH	111	Theatre Practice	1
TH	100	Convocation	0	TH	100	Convocation	0	TH	100	Convocation	0

FOURTH YEAR

EH 551	Shakespeare.....5	TH	Theatre Elective.....6	EH 353	Contemporary Drama or
TH	Theatre Elective.....5	EH 552	Shakespeare.....5	EH 592	American Drama.....5
TH 401	Play Analysis.....3	TH 405	Directing Fund. II.....3	TH	Theatre Elective.....5
TH 404	Directing Fund. I.....3	TH 111	Theatre Practice.....1	TH 406	Directing Fund. III.....3
TH 111	Theatre Practice.....1	TH 100	Convocation.....0	TH 414	Mod. Theatre Backgrounds.....3
TH 100	Convocation.....0			TH 111	Theatre Practice.....1
				TH 100	Convocation.....0

TOTAL—206 QUARTER HOURS

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.



School of Arts and Sciences

EDWARD H. HOBBS, *Dean*

LESLIE CAINE CAMPBELL, *Associate Dean*

GERALD W. JOHNSON, *Associate Dean*

THE SCHOOL OF ARTS AND SCIENCES is the oldest and largest school in Auburn University. Three academic areas—humanities, physical sciences, and social sciences—are represented by the School's 15 departments—Chemistry, English, Foreign Languages, Geography, Geology, History, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Religion, Sociology and Anthropology, and Speech Communication.

In the School of Arts and Sciences a student can gain a broad general education and also acquire depth in the particular field in which he majors. This combination equips him with a strong foundation for post-baccalaureate specialization in graduate studies or professional schools. A further function of this school is to provide courses which are needed by students of all other instructional divisions of the University.

Undergraduate Degrees

Four-year bachelor's degree programs are offered in three areas:

1. The *General Curriculum* offers options in 20 major fields, with a wide choice of minors available both within the School of Arts and Sciences and in other schools of the University.

2. *Pre-professional Programs* are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital and health services administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

3. *Special Curricula* are available in chemistry, chemistry with biochemistry option, criminal justice, foreign language-international trade, geology, laboratory and medical technology, Latin American studies, mathematics, applied mathematics, physics, applied physics, public administration, and public relations.

Embodied in these curricula are the requirements of the University-wide Liberal Education Program.

Graduate Degrees

Master of Arts degrees are offered in English, French, Spanish, history, political science, sociology, and speech communication. Master of Science degrees are offered in chemistry, geology, mathematics, physics, and psychology.

Two special degrees, Master of French Studies and Master of Hispanic Studies, are offered by the Department of Foreign Languages. The School of Arts and Sciences participates in the offering of an interdisciplinary degree, Master of Arts in College Teaching.

Doctor of Philosophy degrees are offered in chemistry, English, history, mathematics, physics, and psychology. Degree programs are described in the *Graduate School Bulletin*.

Teacher Education

Through the Dual Objectives Program a student in the School of Arts and Sciences may prepare for a career as a secondary school teacher with a major in art, chemistry, economics, English, foreign language, geography, history, mathematics, physics, political science, psychology, speech communication, or sociology. See *Arts and Sciences Bulletin* for details.

Dual Degree Program in Engineering

This program provides for enrollment in the General Curriculum of the School of Arts and Sciences for approximately three academic years and in the School of Engineering for approximately two academic years.

The student must complete the basic requirements of the General Curriculum and the requirements for a major therein. The student is not required to complete the minors or take the usual number of hours of electives. Thus he may transfer to the School of Engineering after the end of his Junior Year. Following completion of the academic requirements for one of the eleven baccalaureate degrees in the School of Engineering, he will be awarded two degrees: a degree in his Arts and Sciences major, either a bachelor of science or bachelor of arts depending upon major chosen, and a bachelor's degree in the designated Engineering field. See *Arts and Sciences Bulletin* for more information.

East-European and Russian Studies Program

A student enrolled in the General Curriculum and majoring in history (GHY), philosophy (GPA) or political science (GPO) may elect the East-European and Russian Studies Program. Upon completion of this program and earning a bachelor's degree, the achievement will be noted in the student's transcript.

Consult the Chairman of the Committee on East-European/Russian and Asian Studies regarding this option.

Latin American Studies Program

The student desiring to pursue interdisciplinary studies in the Latin American area may enroll in the Special Curriculum in Latin American Studies. Required are a major in either history (LAH), Spanish (LAF), or political science (LAP), and concentrations in both remaining disciplines. Consult with departmental or the dean's advisers for more information.

Cooperative Education Programs

Cooperative Education Programs which give students an opportunity to integrate their academic training with work experience are offered in art, biology, chemistry, criminal justice, journalism, mathematics, applied mathematics, physics, applied physics, political science, pre-law, psychology, sociology, and speech communication. Students alternate each quarter between school and a work assignment provided through the Director of the Cooperative Education Program.

Advisory Services for Students

The head of the department (or his designee) in which the student majors becomes the student's adviser and is charged with outlining the student's major and minor work. The Office of the Dean, however, provides counseling services to the student before he declares a major. For pre-professional students, counseling on professional school admission tests, admissions requirements and other such matters is provided by special committees and advisers as listed in the *Arts and Sciences Bulletin*.



The General Curriculum (GC)

The General Curriculum is designed to broaden the student intellectually through the humanities and the natural and social sciences. Twenty-one majors are available under this curriculum. (See pages 90-93.)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL	Foreign Language*	5	FL	Foreign Language*	5	FL	Foreign Language*	5
	Group Req. I	3-5		Group Req. I	3-5		Group Req. I	3-5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

PO 209	American Govt.	5	PO 210	State & Local Govt.	5	SY 201	Intr. Sociology	5
GY	Geography**	5		Group Req. II	3-5		Group Req. II	3-5
	Group Req. III	5		Group Req. III	5		Group Req. IV	3-5
EH	Literature***	3	EH	Literature***	3	EH	Literature***	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

*A foreign language through the first year sequence as a minimum. (See page 92.)

**GY 102, World Geography, or a geography course approved by the department of the student's major.

***EH 253-254-255 or EH 260-261-262 or EH 250-251.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student is to complete his major requirements of at least 35 hours, two minors of at least 15 hours each (or a double minor of at least 30 hours), and elective work to total 201 hours. All major and minor courses are to be numbered 200 or above.

TOTAL—201 QUARTER HOURS

GROUP REQUISITE I. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140, 160, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 215. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. This two-course group allows the student to take courses which are prerequisites to his major; or take FED courses which are required in the Dual Objectives program; or take 200-300-level courses to satisfy requirements in a declared major, tentative major, or minor.

GROUP REQUISITE III. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, CH 101-102-104, 103-104, GL 101-102, 101-103, 102-103, 110-103, PS 205-206, or PS 220-221-222.

GROUP REQUISITE IV. A course (3-5 hours) in art, economics (preferably 206), journalism (preferably 315), music, psychology, religion, speech communication, or theatre.

Majors and Minors in the General Curriculum

A student undecided about a major may delay declaring one until the end of his fifth quarter. Before a major is declared, his curriculum will be identified by the symbol GC (General Curriculum). As soon as he is reasonably certain, however, he should declare his major and identify it by the appropriate departmental symbol. (See page 94.) Students should consult with their departmental advisers regularly to plan their major work, clear prerequisites, and take their major courses according to departmental schedule. A minimum of 35 hours is required in each major. All courses must normally be numbered 200 or above.

BACHELOR OF ARTS: Anthropology, Art, Comparative Literature, Earth Sciences, English, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Religion, Social Work, Sociology, Speech Communication, and Theatre.

BACHELOR OF SCIENCE: Biology, Chemistry, Economics, Geography, Mathematics, and Physics.

Since some of the above majors require alignment of courses beginning in the freshman and sophomore years, it is important that the student be alert early in his college career to all of the requirements of his major.

MINORS: Because the student's major will affect his choice of minors it is very important that he consult with his major departmental adviser before selecting either two minors (minimum of 15 hours credit in each) or one double minor (minimum of 30 hours credit) from the following: anthropology, architecture, art, botany, chemistry, criminal justice, economics, English, foreign language, geography, geology, history, journalism, mathematics, music, philosophy, physical education, physics, political science, psychology, religion, sociology, speech communication, theatre, zoology, and additional approved subjects in the Schools of Agriculture, Business, Education, Engineering, or Home Economics. Minor courses must normally be numbered 200 or above. Selected courses at the 100-level are, however, included in art, music, and theatre; for requirements in these fields, the student should see his adviser. A student cannot major and minor in the same field (except in foreign language; see page 92).

THE ANTHROPOLOGY MAJOR. Prerequisites: SY 201. The major will include ANT 203, SY 220, 370, ANT 303 or 403, plus an additional course in each of the four subdisciplines of anthropology: cultural, linguistic, archaeological and physical anthropology. With departmental permission a student may meet the distribution requirement with courses taught in other departments, but hours taken within the major must total 40.

THE ART MAJOR. Prerequisites: AT 111-112-113, and 121-122-123. The major will include AT 231, 232 or 333; 241, 242 or 343; 251, 252 or 353; and 371-372-373, plus fifteen hours of art courses at the 200-level or above. (See also Curriculum in Visual Arts in the School of Architecture and Fine Arts.)

THE BIOLOGY MAJOR. Prerequisites: BI 101-102-103, CH 103-104 including labs, MH 160-161, CH 207-208 and labs, and PS 205-206. The major will include BY 300, 306, ZY 300, 301, 303, 306, and 310, plus two courses chosen from BY 505, 506, 515, and 516, plus two courses chosen from ZY 501, 511, 521, and 524. Students in pre-professional curricula should consult their advisers for special requirements for the Biology Major. (See also Special Curricula in Biological Sciences in the School of Agriculture.)

THE CHEMISTRY MAJOR. Prerequisites: CH 103-104-105 and labs (or 111-112-113), MH 160-161-162, PS 205-206 (or 220-221-222). The major will include CH 204-205, 207-208-209 and labs, plus ten hours of chemistry courses at the 300-level or above. (See also special curricula in Chemistry.)

THE COMPARATIVE LITERATURE MAJOR. Prerequisites: EH 260-261-262. The major will include twenty-five hours chosen from: EH 312, 340, 353, 571, 573, 574, 575, FL 371, 372, and 373, plus ten hours of 300-level or above in English Literature courses or in the literature of a second foreign language if the student can demonstrate proficiency in that language. The student will double minor in one foreign language including five 3-hour courses at the 300-level or above. In special cases the Comparative Literature Committee may accept a minor in another field in place of the Foreign Language Minor. (See also the English/Comparative Literature option in the School of Education, Department of Secondary Education.)

THE EARTH SCIENCES MAJOR. Prerequisites: MH 161, CH 103-104-105 (or three approved courses in biology, botany and/or zoology), GL 103 and 110. The major will include GL 215, 402, plus 20 hours of geology courses at the 200-level or above, plus four 15-hour sequences in other departments subject

to approval by the student's advisory committee. Two of these sequences will fulfill the requirements for minors. (See also Special Curriculum in Geology).

THE ECONOMICS MAJOR. Prerequisites: EC 200 and 202. The major will include EC 551, 554, and 556; plus twenty hours of economics courses at the 300-level or above. EC 206 cannot count toward the major. (See also Curriculum in Economics in the School of Business.)

THE ENGLISH MAJOR. Prerequisites: EH 253-254-255 (or, if qualified, EH 250-251), twenty hours of one foreign language, and five hours of English or European history. The major will include eight approved courses chosen from categories II-VII, two of which will be from Category II, two from Category III, and EH 390. Category VIII courses may be used for general elective credit only. A minimum of 40 hours is required for this major. Within the regular English major program a student may choose an American literature concentration, which will include EH 357, 358, and three courses from EH 472, 591, 592, or 595 in addition to those courses stipulated above; RL 340, HY 511, and 512 are recommended; a list of other suggested courses is available from departmental advisers.

THE FOREIGN LANGUAGE MAJOR. Prerequisites: fifteen hours of first-year level course work in the chosen language. The major will include thirty-five hours of courses at the 200-level or above in the chosen language. Spanish majors will take FL 334-335-336. The student may have a major in one language and a single minor in one other. In this case the student may count toward the bachelor's degree, beyond the eighty hour limit, the number of hours received through advanced placement to a maximum of fifteen. For advanced placement see page 35. (See also Special Curriculum in Foreign Language—International Trade.)

THE GEOGRAPHY MAJOR. Prerequisites: GY 214, 215, EH 304, either SY 220, IE 220 or EC 274. The major will include GY 300, 302, 305, 440, 500, 504, plus ten hours of geography courses at the 300-level or above.

THE HISTORY MAJOR. Prerequisites: HY 101-102-103. The major will include HY 201-202 plus at least 25 hours of history courses at the 300-level or above. The student should consult the History Department each quarter of his junior and senior years regarding completion of his major and minor fields.

THE JOURNALISM MAJOR. Prerequisites: EH 101-102-103, JM 101. The major will include JM 221 (should be scheduled during the sophomore year), 313, 314, 321, 322, 323, 421, 465, 485, and 422-423 or 425. A minimum of 47 hours is required for this major. (See also different journalism major in the Special Curriculum in Public Relations.)

THE MATHEMATICS MAJOR. Prerequisites: MH 161-162-163. The major for *Plan I*, which is oriented toward theoretical mathematics and preparation for graduate school will include MH 264, 265 or 269, 266, 331-332, 520-521, plus two additional approved upper-level mathematics courses. Under *Plan II*, which provides preparation for a computer-related career, the major will include MH 264, 265 or 269, 266, 331, 518, 520, 560, 567, plus one additional approved upper-level course. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned. The minor will not include courses numbered in the 280's or 580's. (See also Special Curricula in Mathematics.)

THE PHILOSOPHY MAJOR. Prerequisites: PA 210, 211 (370 may be substituted with approval), 214 (202 may be substituted with approval). The major will include PA 333 (or 470 or 475 with approval), 334 (or 482, 484, or 590 with approval), 335 (or 380, 402, 432, 513, 580, or 591 with approval), plus twenty hours of philosophy courses at the 300-level or above, at least 15 of which should be 400-500-level.

THE PHYSICS MAJOR. Prerequisites: MH 161-162-163, 264, 265, and IE 204. The ten hour natural science requirement must be met with either chemistry, biology, or geology courses (with labs). The major will include PS 205-206, 210 (or 220-221-222, 320), 215, 300, 301 or 302, 303 or 304, and one additional 5-hour upper-level physics course. The minor will consist of PS 205, 206, and 210 (or 220-221-222, 320). (See also Special Curricula in Physics and Applied Physics.)

THE POLITICAL SCIENCE MAJOR. Prerequisites: MH 140 or 160, or 161. The major will include a minimum of one course to be chosen from PO 300, 301, 521, or 590, and additional political science courses at the 200-level or above beyond PO 209 and 210. Ten hours, other than PO 450 or 451 (if taken), must be at the 400-500-level. (See also Special Curriculum Public Administration.)

THE PSYCHOLOGY MAJOR. The major will include PG 211-212, 215, 320, and at least two other courses of experimental psychology, and four psychology courses at the 400-500-level. A minimum of 41 hours is required for this major.

THE RELIGION MAJOR. Prerequisite: RL 201. The major requires 40 hours in religion courses including 301, and ten hours from RL 210, 220, 230; 25 hours must be at the 300-level or above.

THE SOCIAL WORK MAJOR. Prerequisites: SY 201, PG 330, and written approval of the Social Work Program, Department of Sociology and Anthropology. The major will include SW 252, 375, 376, 380, and SY 304 or 520, 220, and 370, followed by SW 506, 507, 508, 575, and 420 (15 hours). A minor of 15 hours in sociology or anthropology plus one outside minor, will accompany this major.

THE SOCIOLOGY MAJOR. Prerequisites: SY 201. The major will include ANT 203, SY 220, 309 or 502, 370 or RSY 370, plus additional courses to total forty hours, which may include one additional ANT course. Sociology majors may minor in anthropology or social work.

THE SPEECH COMMUNICATION MAJOR. The major will include two courses chosen from SC 200, 301, 350; one course chosen from SC 202, 211, 273, 320, plus 30 additional hours. A minimum of 43 hours is required for this major.

THE THEATRE MAJOR. Prerequisites: TH 104-105-106 and TH 107-108-109. The major will include TH 201, 207, 309; TH 301-302-303; TH 204, 304, 401, 404; plus fifteen additional hours in theatre on the 300-400-level. (See also the Curriculum in Theatre in the School of Architecture and Fine Arts.)

Symbols for Majors

The first letter in each symbol identifies the curriculum; the last two letters indicate the major.

Majors	General Curriculum	Pre-Law	Pre-Dentistry	Pre-Medicine	Pre-Optometry	Pre-Hosp. Adm.	Pre-Vet. Med.
Undeclared	GC	PL	PD	PM	OP	HA	PV
Anthropology		GAN					
Art	GAT						
Biology	GBI	LBI	DBI	MBI	OBI	HBI	VBI
Chemistry	GCH	LCH	DCH	MCH	OCH	HCH	VCH
Comparative Lit.	GCL	LCL	DCL	MCL	OCL	HCL	VCL
Earth Sciences	GGE	LGE	DGE	MGE	OGE	HGE	VGE
Economics	GEC	LEC	DEC	MEC	OEC	HEC	VEC
English	GEH	LEH	DEH	MEH	OEH	HEH	VEH
Foreign Lang.	GFL	LFL	DFL	MFL	OFL	HFL	VFL
Geography	GGY	LGY	DGY	MGY	OGY	HGY	VGy
Health Svc. Admin.						HSA	
History	GHY	LHY	DHY	MHY	OHY	HHY	VHY
Journalism	GJM	LJM	DJM	MJM	OJM	HJM	VJM
Mathematics	GMH	LMH	DMH	MMH	OMH	HMH	VMH
Philosophy	GPA	LPA	DPA	MPA	OPA	HPA	VPA
Physics	GPS	LPS	DPS	MPS	OPS	HPS	VPS
Political Science	GPO	LPO	DPO	MPO	OPO	HPO	VPO
Psychology	GPG	LPG	DPG	MPG	OPG	HPG	VPG
Religion	GRL						
Social Work	GSW	LSW				HSW	
Sociology	GSY	LSY	DSY	MSY	OSY	HSY	VSy
Speech Comm.	GSC	LSC	DSC	MSC	OSC	HSC	VSC
Theatre	GTH						

Pre-Professional Curricula

Pre-professional programs are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital and health services administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine. Advisers are available in each curriculum to guide the students concerning admissions requirements to the professional schools. The department in which students major will advise them in their major work. Completion of these curricula does not assure admission to a professional school. Competition for admission to professional schools is keen; the number of qualified applicants exceeds the number of places available.

Curriculum in Pre-Law (PL)

This curriculum is designed to prepare students for accredited professional law schools, most of which require for admission a bachelor's degree, a good scholastic record, and a good score on the national Law School Admission Test. The pre-law student should take the LSAT at least nine months ahead of the date he expects to enter law school.

A pre-law student who gains admission into an accredited law school short of a degree may obtain a combination bachelor's degree by completing the first three years of this curriculum (including the special requirements listed below) and the freshman year of law school.

FRESHMAN AND SOPHOMORE YEARS

The student will follow the General Curriculum and will take EC 200 as one course in Group Requisite II.

JUNIOR AND SENIOR YEARS

During the junior and senior years, the pre-law student will complete his major requirements of at least 35 hours, two minors of at least 15 hours each, or a double minor of at least 30 hours, and additional work to total 201 hours. He will take EC 202, PG 211, ACF 215, EH 390, HY 306, 571 or 527, PO 501 or 502, and SC 202 or 211 in his major, minor, requisites, or electives. Recommended in addition to these are SC 378 and an additional course in political science, or PG 435.

TOTAL—201 QUARTER HOURS*Major in the Pre-Law Curriculum*

BACHELOR OF ARTS: English, Comparative Literature, Earth Sciences, Foreign Language, History, Journalism, Philosophy, Political Science, Psychology, Sociology, Social Work, and Speech Communication.

BACHELOR OF SCIENCE: Biology, Chemistry, Economics, Geography, Mathematics, and Physics.

A student, upon selection of a major, should check requirements and utilize Group Requisites I, II, III, and IV as much as possible to clear lower level requisites during his freshman and sophomore years. (See Symbols for Majors on page 94.)

Students may take no more than 25 percent of degree requirements in courses offered by the School of Business.

Curriculum in Pre-Dentistry (PD), and Pre-Medicine (PM)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for medical and dental schools. The requirements are very exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

The bachelor's degree is required by most dental and medical schools for admission; however, should an outstanding student gain admission to a dental or medical school prior to graduation, he may receive a combination B.S. degree by completing successfully the first nine quarters of this curriculum, including the special requirements listed under the Junior and Senior years below, a total of 157 quarter hours, and the freshman year of professional school.

A student in pre-dentistry or pre-medicine should take the national Dental Aptitude Test or the Medical College Admission Test at least a year in advance of the date he plans to enter professional school, and follow with an application to the professional school of his choice. The student should seek information from the Premedical-Pre-dental Advisory Committee concerning procedures he must follow to obtain the necessary committee evaluation and recommendation to the professional school to which he seeks admission early in his junior year. Forms and instructions are available in the office of the Dean of Arts and Sciences.

Clinical Preceptorship. The Department of Mathematics participates with the Institute of Medicine and Mathematics of Ohio University, whereby certain pre-medical students who have a strong concentration of work in mathematics (about 50 credit hours) may upon recommendation of the Department of Mathematics be awarded clinical preceptorships which may enhance their acceptance at a medical college. Interested students should contact the head of the department for further information.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	111	General Chemistry.....5	CH	112	General Chemistry.....5	CH	113	General Chemistry.....5
MH	161	An. Geom. & Cal.....5	MH	162	An. Geom. & Cal.....5	MH	163	An. Geom. & Cal.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1
PE		Physical Education.....1	PE		Physical Education.....1	PE		Physical Education.....1

SOPHOMORE YEAR

BI	101	Prin. Biol. & Lab.....5	BI	103	Animal Biol. & Lab.....5	ZY	310	Cell Biology.....5
CH	207	Organic Chem. & Lab.....5	CH	208	Organic Chem. & Lab.....5	CH	209	Organic Chemistry.....5
PS	205	Intr. Physics.....5	PS	206	Intr. Physics.....5	PS	210	Modern Physics.....5
EH		Literature*.....3	EH		Literature*.....3	EH		Literature*.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1

*EH 253-254-255 or EH 260-261-262 or EH 250-251.

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: (a) CH 316 or 507-508, EH 390, PG 211, 212, PQ 209, SY 201, an additional PO or SY course, ZY 300, 302, one 200-level philosophy course, preferably PA 218, and (b) the requirements of his major which are to be selected from those listed under Symbols for Majors on pages 94. Some recommended courses are ANT 203, 206, 207, AT 122, BI 102, BY 215, BY 300, BY 542, 543, CH 205, 518, 519, 520, EC 200, 202, EH 141, FL through the first two quarters of the first year sequence as a minimum (see page 92), GL 101, 102, HY 306, GY 214, 215, IE 204, MH 264, 265, PG 215, RL (200-level), SC 211, SY 202, ZY 301, 519, 520, 524, 560, 561 and/or 300-400-500 level courses in anthropology, English, geography, history, philosophy, political science, psychology, religion, and sociology.

TOTAL—209 QUARTER HOURS

A student should become acquainted with the requirements for his major (see page 90) to begin as early as possible the alignment of courses required.

Curriculum in Pre-Hospital and Health Services Administration (HA)

This curriculum, leading to a Bachelor of Science degree, is designed to help prepare students for careers in such fields as hospital administration, health planning, nursing home administration, governmental health administration and other areas of health services administration. In addition to certain types of employment available immediately upon graduation from the undergraduate program, graduate training is available at other institutions through the Ph.D. level. Students interested in admission to such programs should maintain a B average, should take the appropriate Graduate Record Examination and should make application to the appropriate professional school about a year in advance of the expected date of graduation. Students should consult the Pre-Hospital and Health Services Administration adviser for information on opportunities for employment after graduation and requirements for admission to graduate study.

The student may take no more than 25 percent of degree requirements in courses offered by the School of Business.

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. Biol. & Lab.	5	BI	104	Biol. Human Affairs	5	PO	209	American Govt.	5
MH	160	Pre-Cal. w. Trig.	5			Group Req. I	5			Group Req. II	3-5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1
PE		Physical Education	1	PE		Physical Education	1	PE		Physical Education	1

SOPHOMORE YEAR

EC	200	Economics I	5	EC	202	Economics II	5	EC	274	Bus. & Econ. Stat.	5
ACF	211	Prin. of Accounting	4	ACF	212	Prin. of Accounting	4	SY	201	Intr. Sociology	5
		Group Req. III	3-5	PG	211	Psychology	5	PG	212	Psychology	3
EH		Literature*	3	EH		Literature*	3	EH		Literature*	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

*EH 253-254-255 or EH 260-261-262 or EH 250-251.

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: (a) MN 241, 310, 346, PO 325, 501 or 502, SY 518, and (b) the requirements of his major to be selected from those listed under Symbols for Majors on page 94. Students should consult with the HA Advisor about recommended courses in the junior and senior year.

THE HEALTH SERVICES ADMINISTRATION MAJOR. Arts and Sciences students in the curriculum in Pre-Hospital and Health Services Administration who select this major will take PO 333, 410, 420, 450, 451, 515, 516, 517, and 518, plus ACF 310, MN 207, and SC 204.

TOTAL—203 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. MH 161 or 151.

GROUP REQUISITE II. A 200-level philosophy course.

GROUP REQUISITE III. EH 315 or 390 or SC 211.

A student should become acquainted with the requirements for his major to begin as early as possible the alignment of courses required.

Curricula in Pre-Occupational Therapy (OT) and Pre-Physical Therapy (PT)

These curricula are designed to prepare students for admission to professional schools. The student should strive for a good college record to attain reasonable promise of being selected.

The student should write for official bulletins from the professional schools of his choice early in his freshman year and discuss with his adviser any special requirements of those particular schools. He should make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

Pre-Occupational Therapy (OT)

FRESHMAN YEAR

First Quarter				Second Quarter				Third Quarter			
B1	101	Prin. Biol. & Lab.	5	ZY	250	Human Anatomy	5	PO	209	American Govt.	5
PG	211	Psychology	5			Group Req. I	5	ZY	251	Physiology	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
		ROTC or Elective	1			ROTC or Elective	1			Elective	3
PE		Physical Education	1	PE		Physical Education	1	PE		ROTC or Elective	1
										Physical Education	1

SOPHOMORE YEAR

SY	201	Intr. Sociology	5	SY	202	Social Problems	5	SY	220	Statistics	5
SC	211	Public Speaking	5			Group Req. II	5			Group Req. III	4-5
PG	212	Psychology	3			Group Req. III	5			Elective	3-5
EH	260	Literature	3	EH	261	Literature	3	EH	262	Literature	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

TOTAL—102 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. A course in mathematics, biology, chemistry, or physics.

GROUP REQUISITE II. AT 112 or 121.

GROUP REQUISITE III. An approved course in psychology.

RECOMMENDED ELECTIVES: ANT 203, CH 103-104 and labs., HPR 385, 485, PA 218, PS 200, SY 204, 302, 312.

Students who continue beyond the sophomore year should select courses from alternate group requisites and recommended electives listed above, subject to additional specific requirements of the chosen professional schools. Also recommended are one or more 200-level courses in philosophy and other courses in the humanities and social sciences.

Pre-Physical Therapy (PT)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 103	Fund. Chem. & Lab.	5	CH 104	Fund. Chem. & Lab.	5	PG 211	Psychology	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	SY 201	Intr. Sociology	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
	Group Requisite	3-5		Group Requisite	3-5		Elective	3-5
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

BI 101	Prin. Biol. & Lab.	5	BI 103	Animal Biol. & Lab.	5	PO 209	American Govt.	5
PG 212	Psychology	3	PG 215	Quant. Methods.	5		Group Requisite	3-5
PS 205	Intr. Physics	5	PS 206	Intr. Physics	5		Elective	3-5
EH 260	Literature	3	EH 261	Literature	3	EH 262	Literature	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

TOTAL—103 QUARTER HOURS

GROUP REQUISITE. A minimum of ten hours in art, foreign language, music, philosophy, speech or theatre.

Students who continue beyond the sophomore year should select courses in the sciences, humanities, and social behavioral sciences, subject to additional specific requirements of the chosen professional schools. Especially recommended are ANT 203, 207; BI 102; BY 300; CH 203 (or CH 207-208); EC 200; MH 162-163; PA 218; PG 330; PO 210; SC 211; SY 201, 202; ZY 250, 251, 300, 301, 302, 310.

Curriculum in Pre-Optometry (OP)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for the rigorous demands of American optometry schools. The requirements are exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

Students with outstanding records who are able to gain admission to an accredited school of optometry before graduation may qualify for the combination B.S. degree by one of the following methods: (1) completing successfully the first nine quarters of this curriculum, a total of 152 quarter hours, plus the freshman year of professional optometry school; or (2) completing successfully the first two years of this curriculum, a total of 107 quarter hours, plus three years of professional optometry school.

The Pre-Optometry student should write for an official bulletin from each of the professional schools of his choice during his freshman year, and discuss with the *Pre-Optometry Adviser* any special requirements of those particular schools. The requirements of all the U.S. schools of optometry are covered in the suggested program below, either as required subjects or as electives. He should take the Optometry College Admission Test and make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chemistry	5	CH 112	General Chemistry	5	CH 113	General Chemistry	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5		Group Requisite	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
BI 101	Prin. Biol. & Lab.	5	BI 103	Animal Biol. & Lab.	5	ZY 103	Cell Biology	5
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

HY 101	World History.....	3	HY 102	World History.....	3	HY 103	World History.....	3
CH 207	Organic Chem. & Lab. .5		CH 208	Organic Chem. & Lab. .5			Group Requisite.....	5
PS 205	Intr. Physics.....	5	PS 206	Intr. Physics.....	5	PG 215	Quant. Methods.....	5
PG 211	Psychology.....	5	PG 212	Psychology.....	3		Elective.....	3-5

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior year the student will complete the following: (a) EH 253, 254, 255 or EH 260, 261, 262 or EH 250, 251, PO 209; (b) requirements of his major; (c) electives to complete the degree requirements of 201 hours. Recommended electives are: BI 102, BY 215, 300, CH 209, EC 200, 202, FL through the first two quarters of the first year sequence as a minimum; IE 204, MH 162, 163, PO 210, PG 330, PS 210, SC 211, SY 201, 202, ZY 251, 300, 301, 302, and/or 300-level or above courses in English, history, philosophy, political science, psychology, and sociology.

TOTAL—201 QUARTER HOURS

Group Requisites: A minimum of ten hours in social and behavioral science (PG, SY, EC, ANT, HY, PO).

A student should become acquainted with the requirements for his major to begin as early as possible the alignment of courses.

Curriculum in Pre-Pharmacy (PPY)

This curriculum meets the requirements for admission to the Auburn University School of Pharmacy, which is fully accredited by the American Council on Pharmaceutical Education. Complete information about the professional curriculum in pharmacy may be found on page 176.

To gain admission to the professional curriculum, a student must complete the basic two-year requirements below with a 2.00 (C) average or better and receive approval of his application for admission by the Admissions Committee of the School of Pharmacy. A student who does not qualify for admission to the School of Pharmacy after completion of eight quarters in pre-pharmacy at Auburn University but who meets University continuation in residence requirements may continue to register in pre-pharmacy only by special permission of the Deans of Pharmacy and Arts and Sciences.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 103	Fund. Chem. & Lab.	5	CH 104	Fund. Chem. & Lab.	5	BI 101	Prin. Biol. & Lab.	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	CH 105	Fund. Chem. & Lab.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History.....	3	HY 102	World History.....	3	HY 103	World History.....	3
	ROTC*.....	1		ROTC*.....	1		ROTC*.....	1
PE	Physical Education.....	1	PE	Physical Education.....	1	PE	Physical Education.....	1

SOPHOMORE YEAR

CH 207	Organic Chem. & Lab. .5		CH 208	Organic Chem. & Lab. .5		EH 304	Tech. Writing.....	3
SC 202	App. Speech Comm.	3	PS 206	Intr. Physics or		ZY 250	Human Anatomy.....	5
PS 205	Intr. Physics.....	5	BI 102	Plant Biology.....	5	PCS 260	Pharmacy History & Orient.	3
	Elective**.....	3	EC 202	Economics II.....	5		Elective**.....	5
	ROTC*.....	1		ROTC*.....	1		ROTC*.....	1

*ROTC optional.

**Electives should be selected in consultation with the Pre-Pharmacy adviser.

TOTAL—98 QUARTER HOURS

Curriculum in Pre-Veterinary Medicine (PV)

This curriculum at Auburn is open only to students who are bonafide residents of the State of Alabama. It is preferable to complete this curriculum and earn a baccalaureate degree, although it is possible to gain admission to the School of Veterinary Medicine upon completion of the minimum requirements listed below. The content of the chosen major is the same as in the General

Curriculum (see page 90). A student must declare a major by the end of his/her fifth quarter. Upon successful completion of the four-year curriculum, a Bachelor of Science or Bachelor of Arts degree, depending upon the major chosen, will be awarded. If a student is admitted to the School of Veterinary Medicine prior to completion of the full four years, he/she may obtain a Bachelor of Science degree by successfully completing the first nine quarters of this curriculum plus successfully completing the freshman year of the School of Veterinary Medicine.

The student will be guided by the *Pre-Veterinary Medicine Adviser* regarding this curriculum and by an adviser in the department of his/her major regarding the major subject.

The *minimum* requirements for admission to the School of Veterinary Medicine, Auburn University (128 quarter hours) are as follows (and are also incorporated in the curriculum model below):

LANGUAGE		BIOLOGICAL SCIENCES		PHYSICAL SCIENCES	
EH 101-102-103	(9 hours)	BI 101-102-103	(15 hours)	MH 160-161	(10 hours)
EH 141	(3 hours)	ADS 200	(5 hours)	CH 103-104-105	(15 hours)
		ADS 204	(5 hours)	CH 207-208	(10 hours)
		ADS 302	(4 hours)	PS 205-206	(10 hours)
SOCIAL SCIENCES		BY 300	(5 hours)		
HY 101-102-103	(9 hours)	ZY 300	(5 hours)		
PO 209	(5 hours)				
				OTHER	
				Humanities, Fine Arts, Social	
				Sciences (15 hours); Physical	
				Education (3 hours)	

APPLICATION FOR ADMISSION to the School of Veterinary Medicine must be submitted to the Dean of that school between September 15 and October 15 preceding the admission date. A minimum grade point average of 2.50 is required for application; D grades in required academic courses are not acceptable. All minimum course requirements must be completed by the end of the spring quarter preceding the date of admission, and all advanced required courses in physical and biological science categories (organic chemistry, physics, microbiology, and genetics) must have been completed within six calendar years prior to the anticipated entrance date. Completion of this curriculum does not guarantee admission to a professional school of veterinary medicine. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available. (For further information, see School of Veterinary Medicine in the *Auburn University Bulletin*.)

See also Pre-Veterinary Medicine option, Animal and Dairy Sciences curriculum, School of Agriculture.

FRESHMAN YEAR					
First Quarter		Second Quarter		Third Quarter	
CH 103	Fund. Chem. & Lab. ....5	CH 104	Fund. Chem. & Lab. ....5	CH 105	Fund. Chem. & Lab. ....5
MH 160	Precal. w/Trig. ....5	MH 161	An. Geom. & Cal. ....5	PS 205	Intr. Physics ....5
EH 101	English Comp. ....3	EH 102	English Comp. ....3	EH 103	English Comp. ....3
HY 101	World History ....3	HY 102	World History ....3	HY 103	World History ....3
PE	Physical Education ....1	PE	Physical Education ....1	PE	Physical Education ....1
SOPHOMORE YEAR					
BI 101	Prin. Biol. & Lab. ....5	BI 102	Plant Biology ....5	BI 103	Animal Biol. & Lab. ....5
PS 206	Intr. Physics ....5	CH 207	Org. Chem. & Lab. ....5	CH 208	Organic Chem. & Lab. ....5
ADS 200	Intr. An & Dairy Science ....5	ADS 204	Anim. Biochem. & Nut. ....5	PO 209	American Govt. ....5
EH 141	Medical Vocabulary* ....3		Group Req. 1** ....3		Group Req. 1 ....3
JUNIOR YEAR					
BY 300	Gen. Microbiology ....5	ZY 300	Genetics ....5	ADS 302	Feeds and Feeding ....4
	Major ....5		Major ....5		Major ....5
	Elective ....5		Elective ....3		Elective ....5
	Group Req. 1 ....3		Group Req. 1 ....3		Group Req. 1 ....3
SENIOR YEAR					
	Major ....5		Major ....5		Major ....5
	Major ....5		Major ....5		Major ....5
	Elective ....5		Elective ....5		Elective ....5

*Or a foreign language through the first year sequence.

**GROUP REQUISITE I: These requisites must be earned in humanities, fine arts, and social sciences.

TOTAL—201 Quarter Hours

Special Curricula

Special curricula leading to the Bachelor of Science degree include chemistry, chemistry with biochemistry option, criminal justice, geology, laboratory and medical technology, mathematics, applied mathematics, physics, applied physics, and public administration. The Bachelor of Arts degree may be earned in the Special Curriculum in Foreign Languages-International Trade, the Special Curriculum in Public Relations, and the Special Curriculum in Latin American Studies.

Curriculum in Chemistry (CH)

This American Chemical Society accredited curriculum prepares students for careers in both pure and applied chemistry with a dual emphasis on classroom and laboratory experience. A flexible senior year allows students to tailor the program to their individual professional goals. Graduates will be prepared to enter the profession immediately or continue for advanced degree programs. The senior research program is designed to introduce students to modern advanced techniques and approaches to chemical research in an area of their interests by doing an individual research project in conjunction with a faculty adviser.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
CH 111	General Chem. & Lab. 5	CH 112	General Chem. & Lab. 5	CH 113	General Chem. & Lab. 5
MH 161	An. Geom. & Cal. 5	MH 162	An. Geom. & Cal. 5	MH 163	An. Geom. & Cal. 5
EH 101	English Comp. 3	EH 102	English Comp. 3	EH 103	English Comp. 3
HY 101	World History 3	HY 102	World History 3	HY 103	World History 3
	ROTC or Elective 1		ROTC or Elective 1		ROTC or Elective 1
PE	Physical Education 1	PE	Physical Education 1	PE	Physical Education 1

SOPHOMORE YEAR

CH 205	An. Chem. & Lab. 5	CH 304	Organic Chem. 5	CH 305	Organic Chem. 5
CH 303	Organic Chem. 5		Group Requisite 5		Approved Elective 3-5
MH 264	An. Geom. & Cal. 5	PS 220	Gen. Physics II 4	PS 221	Gen. Physics II 4
	Approved Elective 3	MH 265	Lin. Diff. Equations 3	MH 266	Topics Linear Algebra 3
			ROTC or Elective 1		Elective 1

JUNIOR YEAR

CH 507	Physical Chem. 5	CH 508	Physical Chem. 5	CH 509	Physical Chemistry 5
FL	German** 5	CH 513	Analytical Chem. 5	FL	German** 5
PS 222	Gen. Physics III 4		German** 5	PS 305	Modern Physics 5
	Approved Elective*** 3		Approved Elective 3		Approved Elective 3

SENIOR YEAR

Students will work out with their departmental advisers a program of study to meet their personal professional goals. Included in this program will be: CH 510 - Intermediate Inorganic Chemistry - 5; CH 490 - Special Problems in Chemistry - 5; and 15 credit hours selected from the following courses:

CH 504	Intr. to Molec. Orbital Methods 5	CH 516	Polymer Tech. II 3
CH 511	Intr. Inorgan. Chem. II 5	CH 518	Biochemistry 5
CH 512	Chem. Thermody. 5	CH 519	Biochemistry 5
CH 515	Polymer Tech. I 4	CH 520	Clin. Biochemistry 5

Additional technical and general electives will be selected to complete 205 credit hours.

*Students not prepared for MH 161 must take MH 160 without credit.

**German through the first year sequence. (See page 257.)

***A maximum of six hours of advanced ROTC may be substituted for electives in the junior or senior year. Students will be certified to the American Chemical Society as Certified Graduates when they have made up the electives for which advanced ROTC was substituted.

TOTAL—205 QUARTER HOURS

GROUP REQUISITE: EC 200, PO 209; or SY 201.

APPROVED ELECTIVES

EC 200	General Economics	5	HY 202	History of U.S.	5
EC 206	Socio-Economic Foundations of Contemporary America	3	MU 373	Appreciation of Music	3
EH 253-254-255 or EH 260-261-262		3-3-3	MU 374	Masterpieces of Music	3
EH 350	Shakespeare's Greatest Plays	3	PO 209	American Government	5
EH 365	Southern Literature	3	PG 211	Psychology	5
GY 303	Geography of the Soviet Union	3	SY 201	Introduction to Sociology	5
HY 201	History of U.S.	5	TH 210	Theatre as Entertainment	3

Alternate Curriculum in Chemistry (CH) Biochemistry Option

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chemistry	5	CH 112	General Chemistry	5	CH 113	General Chemistry	5
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

EH 390	Adv. Comp.	5	CH 205	An. Chem. & Lab.	5	BI 101	Prin. of Biol. & Lab.	5
MH 264	An. Geom. & Cal.	5	PS 221	Gen. Physics II.	4	CH 303	Organic Chemistry	5
PS 220	Gen. Physics I.	4	MH 265	Lin. Diff. Equations	3	PS 222	Gen. Physics III.	4
	ROTC or Elective	1		Elective	3		ROTC or Elective	1
				ROTC or Elective	1			

JUNIOR YEAR

BI 103	Animal Biol. & Lab.	5	CH 305	Organic Chemistry	5	CH 509	Physical Chemistry	5
CH 304	Organic Chemistry	5	CH 508	Physical Chemistry	5	BY 300	Gen. Microbiology	5
CH 507	Physical Chemistry	5	ZY 301	Compar. Anatomy	5	ZY 524	Animal Physiology	5
	Approved elective	3		Approved elective	3		Approved elective	3

SENIOR YEAR

CH 518	Biochemistry	5	CH 519	Biochemistry	5	CH 520	Clin. Biochemistry	5
FL	German**	5	FL	German**	5	FL	German**	5
	Group Req.	5	CH 513	An. Chem.	5		Approved elective	3-5
	Approved elective	3		Approved elective	3		Approved elective	3

*Students not prepared for MH 161 must take 160 without credit.

**German through the first year sequence. (See page 257.)

TOTAL—204 QUARTER HOURS

GROUP REQUISITE: EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EC 200	General Economics	5	HY 202	History of U.S.	5
EC 206	Socio-Economic Foundations of Contemporary America	3	MU 373	Appreciation of Music	3
EH 253-254-255 or EH 260-261-262		3-3-3	MU 374	Masterpieces of Music	3
EH 350	Shakespeare's Greatest Plays	3	PO 209	American Government	5
EH 365	Southern Literature	3	PG 211	Psychology	5
GY 303	Geography of the Soviet Union	3	SY 201	Introduction to Sociology	5
HY 201	History of U.S.	5	TH 210	Theatre as Entertainment	3

Curriculum in Criminal Justice (CJ)

This curriculum prepares students for professional careers in criminal justice agencies at all levels of government. It offers two alternative specializations: *Law Enforcement*; or *Offender Rehabilitation* with options in either adult corrections or youth services.

The curriculum is administered by the Department of Political Science. This curriculum model does not show all the possible variations; students should consult the *Criminal Justice Adviser* before enrolling.

FRESHMAN YEAR									
First Quarter			Second Quarter			Third Quarter			
		Group Req. I.....3-5			Group Req. I.....3-5			Group Req. I.....3-5	
		Group Req. II.....3-5			Group Req. II.....4-5			Group Req. II.....4-5	
EH 101		English Comp.....3	EH 102		English Comp.....3	EH 103		English Comp.....3	
HY 101		World History.....3	HY 102		World History.....3	HY 103		World History.....3	
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1	
PE		Physical Education.....1	PE		Physical Education*.....1	PE		Physical Education*.....1	
SOPHOMORE YEAR									
ACF 211	or 215 Acct.....4		PO 210	State & Loc. Govt.....5		EC 200	Economics I.....5		
PO 209	American Govt.....5		SY 201	Intr. Sociology.....5		LE 260	Surv. of Law Enf.....5		
PG 211	Psychology.....5			Group Req. III.....3-5		SC	202 or 211.....3-5		
EH	Literature**.....3		EH	Literature**.....3		EH	Literature**.....3		
	ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1		

*PE requisites: **Second Quarter.** PE 130, 132, PE 134, or 131. **Third Quarter.** PE 162, 150, 230, or 231, or 102, or 103 as required.

**EH 253-254-255 or EH 260-261-262 or EH 250-251.

JUNIOR AND SENIOR YEARS

Students in both the *law enforcement specialization* and the *offender rehabilitation specialization* will complete EH 315; HPR 351 or 396 or 494 or 597; LE 262, 270, 335, 464; PG 301 or 536; SY 204 or PG 330 or PG 212; SY 308 or 304 or 520; SY 302; PO 325 or 327. PO 501 and 502 (PO 332 may be taken in lieu of 501, or PO 336 may be taken in lieu of 502, but in any case either PO 501 or 502 must be taken).

The student in the *law enforcement specialization* will complete LE 261, 361, 363, 461; PO 323 or 505 or 518; PO 515 or PO 410; and SY 505 or 525 or 550. The student in the *offender rehabilitation specialization* will complete CED 521, HPR 597 or 396; SW 375; three courses from SY 304, 525, 526, 530, PG 215.

TOTAL—201 QUARTER HOURS

GROUP REQUISITE I. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140 or 160, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, CH 101-102-104 or 103-104 or 111-112-113, GL 101-102, 101-103, 102-103, 110-103, PS 205-206, or 220-221-222.

GROUP REQUISITE III. A minimum of 9 hours in art, foreign language, geography, literature, music, philosophy, religion, or theatre courses.

Curriculum in Foreign Languages—International Trade (FLT)

The curriculum enables students to combine foreign language studies in French, German, and Spanish with specifically selected business subjects, in order to open a broad variety of possible career opportunities. Such preparation also affords them the choice of graduate or other advanced study in either field, be it in universities or in specialized language or business institutes. This curriculum, especially if continued at the graduate level, can lead to government or teaching employment from federal and state service through university and junior college. Primary career application may be found with national or international firms engaged in foreign trade (within the United States or abroad), in the transportation and hotel industries, in international brokerage houses, and in a number of foreign trade management, public relations, and documentation/translation positions.

The following four-year program satisfies the requirements for graduation with a Bachelor of Arts degree in foreign languages (French, German, Spanish). See also Foreign Language Major and Minor under Majors and Minors in the General Curriculum page 92.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL	First Yr. Lang. I	5	FL	First Yr. Lang. II	5	FL	First Yr. Lang. III	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
MH 140	or 160 Algebra or		MH 151	or 161 Finite or Calc.	5	SY 201	Intr. Sociology	5
PE	Alg./Trig.	5	PE	Physical Education	1	PE	Physical Education	1
PE	Physical Education	1						

SOPHOMORE YEAR

FL	Sec. Yr. Lang. I	5	FL	Sec. Yr. Lang. II	5	FL	Sec. Yr. Lang. III	5
EC 200	Science*	5	EC 202	Science*	5	PO 209	American Govt.	5
EH 260	Economics I	5	EH 261	Economics II	5	ACF 211	Accounting I	4
	World Lit. I	3		World Lit. II	3	EH 262	World Lit. III	3

JUNIOR YEAR

FL	Conversation	3	FL	Composition	3	FL	Civilization	3
PO 210	State & Local Govt.	5	MT 331	Prin. of Mktg.	5	MN 310	Prin. of Mgt.	3
ACF 212	Accounting II	4	GY 302	Econ. Geog.	5	ACF 361	Business Finance	5
EH 315	B & P Rpt. Writing	3	MN 207	Data Processing	2		A & S Elec.**	5
				General Elective	3			

SENIOR YEAR

FL	Elective***	3	FL	Elective***	3	FL	Elective***	3
MT 440	International Mktg.	5	FL	329-339-359	3	EC 571	Intern. Economics	5
	Intern. Trade Elec.	5		A & S Elec.	5		General Elective	5
	General Elective	3		General Elective	5		General Elective	3

*10 hours from the following approved electives: BI 101-102, 101-103, 101-104, CH 101-102-104, 103-104, GL 101-102, 101-103, 110-103, PS 205-206, or PS 220-221-222.

**10 hours from the following approved electives: GY 102, 215, 303, 304, 305, 306, 307, 308, 401, HY 300, 301, 355, 380, 527, 528, 529, 533, 535, 536, 544, 545, 552, 554, 555, 572, PO 309, 311, 312, 314, 445, 526, 535, 539, 540, 541, RL 230, 301, SY 520, ANT 305, 511 or another foreign language.

***300-level or above elective.

Students may take no more than 25 percent of degree requirements in courses offered by the School of Business.

TOTAL—201 QUARTER HOURS

Curriculum in Geology (GL)

This curriculum prepares the student broadly in all aspects of geological processes and principles. This should enable him to make a more intelligent selection of a graduate program of study that will permit specialization in one or more of the many aspects of the science—economic geology, geophysics, geochemistry, petrology, paleontology, ground water geology, or environmental geology, as well as other special fields from astrogeology to oceanography. Employment for the geologist ranges from federal and state service through university or college and industrial programs to private consulting.

The following four-year program satisfies the requirements for graduation with a Bachelor of Science degree in geology. (See also Earth Sciences major under Majors and Minors in the General Curriculum, page 91.)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. of Biol. & Lab.	5	BI 102	Plant Biology	5	BI 103	Animal Biol. & Lab.	5
GL 110	Physical Geology	5	GL 103	Historical Geology	5	MH 161	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR*

CH 103	Chemistry & Lab.	5	CH 104	Chemistry & Lab.	5	CH 105	Chemistry & Lab.	5
GL 205	Paleobotany	5	GL 206	Invert. Paleozoology	5	PO 209	American Govt.	5
MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5		Elective	3-5
EH	Literature**	3	EH	Literature**	3	EH	Literature**	3

JUNIOR YEAR

GL 301	Mineralogy	5	GL 302	Optical Mineralogy	5	GL 305	Ign. & Met. Pef.	5
PS 205	Intr. Physics I	5	PS 206	Intr. Physics II	5	PO 210	State & Local Govt.	5
	Minor I	5		Minor I	5		Minor I	5

SENIOR YEAR

GL 401	Sed. Pet.....5	GL 402	Struct. & Geol.....5	GL 411	Stratigraphy.....5
	Group Requisite.....5		Minor II.....5	GL 421	Economic Geology.....5
	Minor II.....5		Elective.....5		Minor II.....5

*During the Summer Quarter, following the second year, the student should take GL 215 (4) and TS 102 (2).

**EH 253-254-255 or 260-261-262 or 250-251

TOTAL—202 QUARTER HOURS

GROUP REQUISITES AND MINORS

GROUP REQUISITE. A course in music, theatre, art, speech communication, or journalism.

MINORS. Two 15-hour minors (or one 30-hour double minor) should be selected from those under the General Curriculum with the advice and approval of the student's departmental adviser. Students planning a minor in chemistry, civil engineering, or physics should also plan a second minor in mathematics.

Curriculum in Laboratory Technology (LT) and Medical Technology (MDT)

This curriculum, leading to the degree of Bachelor of Science in Laboratory Technology or Medical Technology, is designed for men and women who wish to prepare for clinical and other laboratory positions in such fields as public health and bacteriology. Most of the graduates in this curriculum enter the field of clinical medicine as medical technologists. They should plan to attain status as Registered Medical Technologists by interning for one year in an approved hospital and then passing the National Registry of Medical Technologists written examination.

The *Medical Technology option* leads to the Bachelor of Science degree in Medical Technology (conferred by Auburn University). Degree requirements include successful completion of nine quarters of the laboratory technology curriculum and one year's satisfactory training in a hospital school of medical technology approved by the National Accrediting Agency of Clinical Laboratory Sciences and by the Head of the Department of Chemistry at Auburn University. Graduates of this curriculum should plan to attain status as Certified Medical Technologists by passing the National Certification Examination.

Further requirements include: (1) Auburn University students transferring into medical technology must complete in the laboratory technology curriculum one academic year (54 hours) preceding the year of internship. (2) Transfers from other institutions who choose the medical technology option must complete the third year of the laboratory technology curriculum at Auburn prior to internship.

FRESHMAN YEAR

First Quarter

CH 111	Gen. Chem. & Lab.....5
MH 160	Pre-Cal. w. Trig.....5
EH 101	English Comp.....3
HY 101	World History.....3
LT 101	Orientation.....1
PE	Physical Education.....1

Second Quarter

BI 101	Prin. Biol. & Lab.....5
CH 112	Gen. Chem. & Lab.....5
EH 102	English Comp.....3
HY 102	World History.....3
PE	Physical Education.....1

Third Quarter

BI 103	Animal Biol. & Lab.....5
CH 113	Gen. Chem. & Lab.....5
MH 161	An. Geom. & Cal.....5
EH 103	English Comp.....3
PE	Physical Education.....1

SOPHOMORE YEAR

CH 207	Organic Chem. & Lab.....5
PS 205	Intr. Physics I.....5
HY 103	World History.....3
HPR 195	Health Science.....3

CH 208	Organic Chem. & Lab.....5
PS 206	Intr. Physics II.....5
ZY 250	Human Anatomy.....5
EH 141	Medical Vocabulary.....3

CH 204	An. Chem. & Lab.....5
BY 300	Gen. Microbiology.....5
ZY 251	Physiology.....5

JUNIOR YEAR

CH 301	Biochemistry.....5	CH 302	Biochemistry.....5	CH 520	Clin. Biochemistry.....5
LT 301	Hematology.....5	LT 404	Immunology I.....5	LT 401	Adv. Hematology.....5
BY 446	Clin. Microbiology.....5	ZY 511	Gen. Parasitology.....5		Group Requisite I.....5
HY 306	Contemp. Affairs.....3				Elective.....5

SENIOR YEAR

ZY 308	Micrology.....5	ZY 509	Histology.....5	LT 405	Immunology II.....5
EH 304	Technical Writing.....3	SC 202	App. Sp. Comm.....3		Group Requisite II.....5
	Elective.....3-5		Elective.....10	PCS 563	Public Health.....5
LT 525	Clin. Instr.....5				

TOTAL—205 QUARTER HOURS

GROUP REQUISITE I. EC 200, PO 209, or SY 201.

GROUP REQUISITE II. ZY 300, 310, or 524.

APPROVED ELECTIVES

EC 200	General Economics.....5	HY 201	History of U.S.....5
EC 206	Socio-Economic Foundations of Contemporary America.....3	HY 202	History of U.S.....5
EH 253-254-255 or EH 260-261-262	3-3-3	MU 373	Appreciation of Music.....3
EH 350	Shakespeare's Greatest Plays.....3	MU 374	Masterpieces of Music.....3
EH 365	Southern Literature.....3	PO 209	American Government.....5
FL*	French or German.....5-5	PG 211	Psychology.....5
GY 303	Soviet Union, Land & People.....3	SY 201	Introduction to Sociology.....5
		TH 210	Theatre as Entertainment.....3

*French or German through the first two quarters of the first year sequence as a minimum. (See pages 255-257.)

Curriculum in Mathematics (MH)

This curriculum is designed to prepare students for graduate study and eventual careers as mathematicians. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned. The General Curriculum should be used by students who prefer flexibility in the design of their program (see page 92).

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
FL	Foreign Language*.....5	FL	Foreign Language*.....5	FL	Foreign Language*.....5
MH 161	An. Geom. & Cal**.....5	MH 162	An. Geom. & Cal.....5	MH 163	An. Geom. & Cal.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
	ROTC or Elective.....1		ROTC or Elective.....1		ROTC or Elective.....1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.....5	MH 265	Lin. Diff. Equations.....3	MH 331	Intr. Mod. Alg. I.....5
	Natural Science.....4-5	MH 266	Top. in Lin. Alg.....3		Natural Science.....4-5
EH	Literature††.....3		Natural Science.....4-5	EH	Literature††.....3
	ROTC or Elective.....1	EH	Literature††.....3		ROTC or Elective.....1
PE	Physical Education.....1		ROTC or Elective.....1	PE	Physical Education.....1
		PE	Physical Education.....1		

JUNIOR YEAR

FL	Foreign Language*.....5	FL	Foreign Language*.....5	FL	Foreign Language*.....5
MH 332	Intr. Mod. Alg. II.....5	MH 531	Intr. Mod. Alg. III.....5	MH 521	Analysis II.....5
	Elective†††.....3	MH 520	Analysis I.....5		Requisite.....3-5
	Elective.....3		Elective.....3		Elective.....3

SENIOR YEAR

MH 522	Analysis III.....5	MH	Requisite.....5	MH	Requisite.....5
	Requisite.....3-5		Group Requisite.....5		Group Requisite.....5
	Elective.....5		Elective.....5		Elective.....5
	Elective.....3		Elective.....3		Elective.....3

*Completion of two languages, French, German, Russian, through the first year sequence or one of these languages through the second year sequence. (See pages 255-258.)

**Students not prepared for MH 161 must take MH 160 without credit.

†The natural science requirement may be met by taking PS 220-221-222 or CH 111-112-113. If the 12-hour physics sequence is selected, an additional 3-hour elective will be needed to meet the 196-hour requirement.

††EH 253-254-255 or 260-261-262.

†††Appropriate electives to meet the interests of the student may be selected in consultation with his departmental adviser.

TOTAL—196 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITES. These requisites are chosen from one of the following areas of social science: economics, education, history, political science, psychology, or sociology.

Curriculum in Applied Mathematics (AMH)

An important feature of this curriculum is the option for the student to concentrate, by means of technical electives, on an important area to which mathematics can be applied: one of the traditionally allied fields such as engineering, physical science, or computer sciences; or the more recently allied areas such as biology (ecological systems, cell models), behavioral science or managerial science. In order to graduate with a major in mathematics, a student must have an overall C average or better in all mathematics courses attempted which are required for the major, above the 100-level, and for which a grade other than W has been assigned.

This is a professional mathematics curriculum. Students who desire more flexibility or more emphasis on the liberal arts should pursue the GMH or MH curriculum.

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 161	An. Geom. & Cal.*.....5	MH 162	An. Geom. & Cal.*.....5	MH 163	An. Geom. & Cal.*.....5
CH 103	Fund. Chem. & Lab. or.....5	CH 104	Fund. Chem. & Lab. or.....5	PS 220	Gen. Physics I.....4
BI 101	Prin. Bio. & Lab.....5	BI 102	Plant Biology or.....5	EH 103	English Comp.....3
EH 101	English Comp.....3	BI 103	Animal Biology or.....5	HY 102	World History.....3
PE	Physical Education.....1	BI 104	Biology in Human Affairs.....5	PE	Physical Education.....1
		EH 102	English Comp.....3		
		HY 101	World History.....3		
		PE	Physical Education.....1		
			ROTC or Electives.....1		

SOPHOMORE YEAR**

MH 264	An. Geom. and Cal.....5	MH 269	Elem. Diff. Equations.....5	MH 331	Intr. Mod. Alg. I.....5
PS 221	Gen. Physics II.....4	PS 222	Gen. Physics II.....4		Group Requisite I.....5
HY 103	World History.....3	MH 266	Topics Lin. Algebra.....3	MH 362	Engr. Math. I.....3
IE 204	Computer Program.....3		Group Requisite II.....5		Elective.....3

JUNIOR YEAR

MH 332	Intr. Mod. Alg. II.....5	MH 521	Analysis II.....5	MH 522	Analysis III.....5
MH 520	Analysis I.....5	MH 567	Math. Statistics I.....5	MH 568	Math. Statistics II.....5
	Group Requisite II.....5		Group Requisite II.....5		Group Requisite II.....5
			Elective.....3		Elective.....3

SENIOR YEAR

MH 560	Intr. Num. Analysis.....5	MH 561	Num. Matrix Analysis.....5	MH 503	Engr. Math. II.....5
MH 510	Intr. Cal. of Variations.....3		Group Requisite I.....5		Group Requisite I.....5
	Group Requisite I.....10	MH	Requisite.....3 or 5	MH 506	Elem. Part. Diff. Equations.....3
			Elective.....5		or
				MH 528	Lin. Diff. Sys.....3

*Students not prepared for MH 161 must take MH 160 without credit.

**By the middle of the sophomore year the student is expected to be familiar with the basic programming language. He may gain this knowledge by taking either the two one-hour courses MH 163L and MH 264L or the two-hour course EE 202.

TOTAL—198 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I

A minimum of 25 hours of requisite credit must be taken in areas especially concerned with the application of mathematics. At least 15 hours must be taken in the same area. The primary areas for such concentration are:

Botany-Zoology	Physics	Civil Engineering
Chemistry	Psychology	Electrical Engineering
Economics	Aerospace Engineering	Industrial Engineering
Geology	Chemical Engineering	Mechanical Engineering

Lists of acceptable courses in each of these areas are available through the Departmental Office.

GROUP REQUISITE II

A minimum of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study beyond the Master's level should include a foreign language in Group Requisite II; in such case they must also take a social science course of at least five hours credit.

Curriculum in Physics (PS)

This curriculum provides a fundamental preparation for careers in the physical and allied sciences and a foundation for graduate study in physics and related fields.

Because of the role of physics in modern civilization, graduates find opportunities in industrial and governmental research and development; chemical, geological, biological, and mathematical physics; medical and dental research; environmental preservation and control; and teaching and/or research at the college or university level.

An outstanding feature of the curriculum is the senior research participation wherein investigations of basic experimental problems are undertaken under the supervision of senior staff members.

Inquisitive students with exceptional abilities in mathematics and physical science, and special aptitudes for research, will find the physics curriculum a challenging inducement to test their competence and to strive for high levels of attainment.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chem.	5	CH 112	General Chem.	5	CH 113	General Chem.	5
MH 161	An. Geom. & Cal.*	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	PS 220	Gen. Physics I.	4
HY 204	Tech. & Civil.**	3	HY 205	Tech. & Civil.**	3	HY 206	Tech. & Civil.**	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
FL	German***	5	FL	German***	5	FL	German***	5
MH 264	An. Geom. & Cal.	5	PS 222	Gen. Physics III.	4	PS 305	Intr. Mod. Physics	5
PS 221	Gen. Physics II.	4	IE 204	Computer Program	3	PS 300	Elec. & Mag.	4
EH 103	English Comp.	3	MH 265	Lin. Diff. Equations	3	MH 266	Topics Lin. Algebra	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
PS 301	Electromagnetism	5	MH 506	Elem. Partial D.E.	3	PS 303	Optics	5
	Soc. Sci. Elective	5	PS 302	Electronics	5		Electives	11
MH 501	Cal. Vector Funct.	3		Electives	10			
PS 340	Interm. Mech.	3						

SENIOR YEAR

First Quarter			Second Quarter			Third Quarter		
PS 501	Mechanics I.	5	PS 502	Mechanics II.	5	PS 504	Thermodynamics	5
PS 515	Mod. Physics I.	5	PS 516	Mod. Physics II.	5		Group Requisite	5
	Group Requisite	5		Group Requisite	5	PS 507	Adv. Lab. II	2
			PS 506	Adv. Lab. I.	2		Electives	6

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

***Through the first year sequence as a minimum. French or Russian may be substituted. (See pages 255-258.)

TOTAL—207 QUARTER HOURS

GROUP REQUISITES

PS 505	Nuclear Physics	PS 535	Intr. to Solid State	PS 560	Astrophysics
PS 517	Biophysics	PS 545	Plasma Physics		

Curriculum in Applied Physics (APS)

This curriculum provides a foundation in physics and emphasizes several related technical fields to provide a broader base for persons who desire to enter industrial and governmental laboratories. Individuals wishing to pursue graduate work will find that this curriculum also provides adequate preparation for advanced study.

During the junior and senior years, 20 hours of specialized courses are designated as Group Requisite I. These are to be chosen from one of the following areas: chemistry; geology; aerospace, chemical, electrical or mechanical engineering; mathematics; or computer, environmental or nuclear science.

Students anticipating graduate work should complete French, German, or Russian through the first year sequence as a part of Group Requisite II. (See page 109.)

To those who are motivated as doers, who desire full understanding of how the physical world works, this curriculum will provide a challenge and a stimulus.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chem.	5	CH 112	General Chem.	5	CH 113	General Chem.	5
MH 161	An. Geom. & Cal.*	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	PS 220	Gen. Physics I	4
HY 204	Tech. & Civil.**	3	HY 205	Tech. & Civil.**	3	HY 206	Tech. & Civil.**	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5		Group Requisite I	5	PS 305	Intr. Mod. Physics	5
ME 205	Appl. Mech. Statics**	4	PS 222	Gen. Physics III	4		Group Requisite I	5
PS 221	Gen. Physics II	4	IE 204	Computer Program	3	PS 300	Elec. & Mag.	4
EH 103	English Comp.	3	MH 265	Lin. Diff. Equations	3	MH 266	Topics Lin. Algebra	3
TS 113	Tool Lab	1	TS 102	Eng. Drawing	2		ROTC or Elective	1
	ROTC or Elective	1		ROTC or Elective	1			

JUNIOR YEAR

PS 301	Electromagnetism	5	MH 506	Elem. Partial D.E.	3	PS 303	Optics	5
	Group Requisite I	5	PS 302	Electronics	5	PS 521	Modern Electronics	5
MH 501	Cal. Vector Funct.	3	PS 340	Interm. Mech.	3		Group Requisite II	5
				Group Requisite II	5			

SENIOR YEAR

PS 501	Mechanics I	5	PS 502	Mechanics II	5	PS 504	Thermodynamics	5
PS 515	Mod. Physics I	5	PS 516	Mod. Physics II	5		Physics Req.***	5
	Group Requisite II	5	PS 506	Adv. Lab. I	2	PS 507	Adv. Lab. II	2
				Group Requisite I	5		Elective	5

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

***Students selecting fields other than engineering for their specialization area (via Group Requisite I) may elect to take an additional course in that area as a substitution for ME 205.

****Students electing the nuclear science option under Group Requisite I must select a course other than PS 505 for this requirement.

TOTAL—207 QUARTER HOURS

GROUP REQUISITE I

Courses to be used to satisfy this requirement are to be selected by the student after consultation with and a recommendation by the department (s) in which the courses are to be taken and upon the approval of his adviser.

GROUP REQUISITE II

A minimum total of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study should include a foreign language in Group Requisite II as mentioned above; in such case they must also take a social science course for at least five hours credit.

Curriculum in Public Administration (PUB)

This curriculum is designed to prepare students for careers in the administration of governmental units. The Political Science Department is a member of the National Association of Schools of Public Affairs and Administration. An option in Pre-City Management is designed to prepare students for graduate work in City Management. This program may be worked out with the *Public Administration Adviser*.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
PA	202	Ethics and Society.....5	PO	209	American Govt.....5	PO	210	Am. State & Loc. Govt. 5
		Group Req. I.....4-5			Group Req. I.....4-5			Group Req. I.....4-5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1
PE		Physical Education.....1	PE		Physical Education.....1	PE		Physical Education.....1

SOPHOMORE YEAR

SY	201	Intr. Sociology.....5	EC	200	Economics I.....5	EC	202	Economics II.....5
ACF	211	Prin. of Accounting.....4	ACF	212	Prin. of Accounting.....4	SY	202	Social Problems.....5
		Group Req. II.....3-5			Group Req. II.....3-5			Group Req. II.....3-5
EH		Literature.....3	EH		Literature.....3	EH		Literature.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1

*EH 253-254-255 or EH 260-261-262 or EH 250-251.

JUNIOR AND SENIOR YEARS

The student will complete the following: PO 300, 323, 325, 326, 327, 328, 329, 333, 501, 502, 514, 515, 518, 519, PG 211, SC 211; and at least 13 hours from the following: EH 315, MN 346, PO 260, 450-451.

TOTAL—201 HOURS**GROUP REQUISITES**

GROUP REQUISITE I. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, CH 101-102-104, 103-104, GL 101-102, 101-103, 102-103, 110-103, PS 205-206, 220-221-222.

GROUP REQUISITE II. The student will choose any three courses from the following: Mathematics, HY 201, 202, PA 210, GY 203, JM 315, SC 202, FL through the first two quarters of the first year sequence as a minimum (See page 92).

Curriculum in Public Relations (PRJ or PRS)**FRESHMAN YEAR**

First Quarter			Second Quarter			Third Quarter		
FL		Foreign Language*.....5	FL		Foreign Language*.....5	FL		Foreign Language*.....5
		Group Req. I.....3-5			Group Req. I.....3-5			Group Req. I.....3-5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		ROTC or Elective.....1			ROTC or Elective.....1	JM	101	Newspaper Style.....3
PE		Physical Education.....1	PE		Physical Education.....1			ROTC or Elective.....1
						PE		Physical Education.....1

SOPHOMORE YEAR

PO	209	American Govt.....5	PO	210	State & Loc. Govt.....5	SY	201	Intr. Sociology.....5
		Major Course.....3-5			Major Course.....3-5			Major Course.....3-5
		Group Req. II.....5			Group Req. II.....5			Intr. Pub. Rel. **.....5
EH		Literature***.....3	EH		Literature***.....3	EH		Literature***.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1

*A foreign language through the first year sequence as a minimum.

**Either JM 204 or SC 204 may be taken depending upon the student's major.

***EH 253-254-255 or EH 260-261-262 or EH 250-251.

JUNIOR AND SENIOR YEARS

The student in the Public Relations Curriculum will select a major in Journalism (PRJ) with a minor in Speech Communication or a major in Speech Communication (PRS) with a minor in Journalism and elective work to total 201 hours.

TOTAL—201 QUARTER HOURS**GROUP REQUISITES**

GROUP REQUISITE I. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140 or 160, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of the Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104; CH 101-102-104 or 103-104 or 111-112-113; GL 101-102, 101-103, 102-103, 110-103; PS 205-206 or 220-221-222.

MINOR

The minor in Speech Communication will consist of three of the following:

SC 301	Speech Comm. Theories	5	SC 336	Tel. Production-Direction I	5
SC 211	Public Speaking	5	SC 338	Broadcast News Writing	5

The minor in Journalism will consist of the following:

JM 221	Beginning Newswriting	5	JM 321	Newspaper Makeup and Layout	5
JM 224	Copyreading or Editing	3	JM 322	Feature Writing	5
JM 313	Reporting	5			

The student will take at least 20 hours from the following courses:

MT 331	Prin. of Marketing	5	PG 531	Social Psychology	5
MT 341	Consumer Analysis	5	PO 341	Pressure Groups	3
MT 432	Promotional Strategy	5	EH 304	Technical Writing	3
SY 204	Social Behavior	5	EH 315	B & P Report Writing	3
SY 507	Pub. Opinion and Propaganda	5	EH 390	Advanced Composition	5
PG 211	Psychology	5	EH 415	Written Business Comm.	3
EC 202	Economics II	5			

Curriculum in Materials Engineering (MTL)

An interdisciplinary curriculum in materials engineering is administered by the Department of Mechanical Engineering in the School of Engineering. It is conducted cooperatively by academic departments of the schools of Engineering and Arts and Sciences through a faculty Materials Engineering Curriculum Committee. (See page 155).

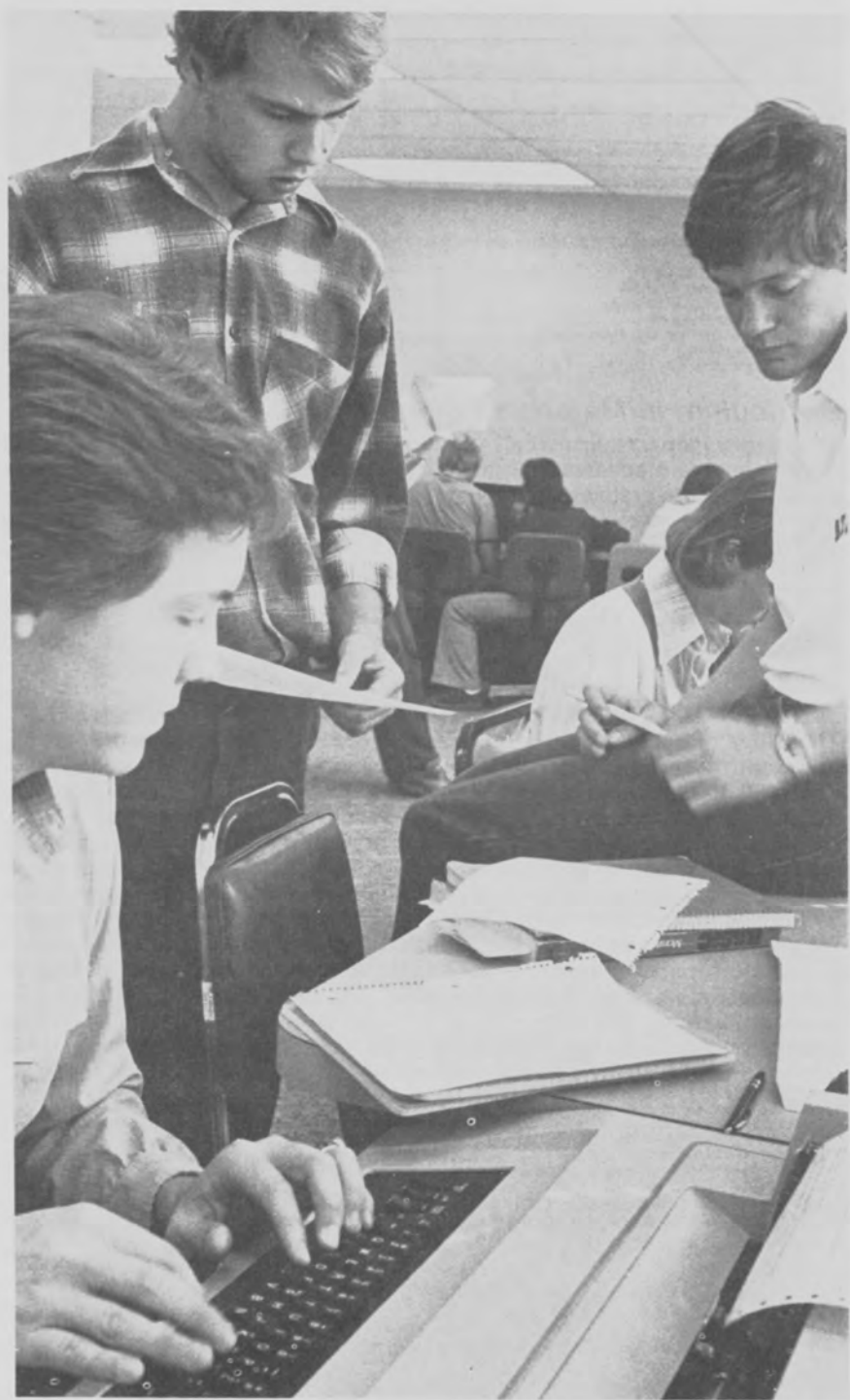
Office of Public Service and Research

K. J. WARD, *Director*

E. SMITH, *Extension Associate and Editor*

J. L. CANNON, *Extension Associate and Coordinator of Training*

The Office of Public Service and Research (OPSR) complements the instructional and research programs of Auburn's School of Arts and Sciences with the capability to respond positively to public sector needs. Organized to provide coordination and leadership, OPSR helps faculty and departments to develop, conduct and administer general extension activities and public policy research. This research is in the areas of county and municipal government finance, energy conservation, and productivity. Training activities in technical writing, communication, administration, and management include programs for county government officials, housing authority personnel, hospital administrators, parks and recreation officials, various professional associations, and local, state, and federal agencies. Through practical and efficient research, training and instructional services, OPSR connects the University and the public sector by contributing to the base of knowledge necessary for informed public policy decision-making.



School of Business

GEORGE R. HORTON, JR., *Dean*

H. ELLSWORTH STEELE, *Associate Dean*

The SCHOOL OF BUSINESS prepares students to become effective and socially responsible managers of business organizations and responsible citizens and leaders of society.

To achieve this goal, the School offers undergraduate programs leading to the Bachelor of Science in Business Administration. These programs have been accredited by the American Assembly of Collegiate Schools of Business. In addition, it offers graduate work for the degrees of Master of Business Administration (MBA), Master of Science (MS) in both Economics and Business, and the Master of Arts in College Teaching (MACT). More detailed information on these last programs may be found in the *Graduate School Bulletin*.

Curriculum

The undergraduate curriculum includes a two-year Pre-Business Program required of all students and a two-year Professional Option Program. These programs provide a balanced course of study for all students, with approximately one-half of the hours in business and economics courses and one-half in courses offered outside the School. The courses required have been selected so that all students will have access to the "common body of knowledge" as designated by the American Assembly of Collegiate Schools of Business.

The Pre-Business Program, a plan followed by all business students in their freshmen and sophomore years, provides a sound foundation of work in the arts and sciences, including courses in mathematics, humanities, social sciences, and natural sciences. This lower division program also includes some of the introductory business courses.

The Professional Option Programs are offered through the Departments of Accounting and Finance; Economics; Management; and Marketing and Transportation. The Professional Option plans allow each student to concentrate in an area of interest during the junior and senior years. The nine options available include: Accounting (AC), Finance (FI), Economics (EC), General Business (GB), General Business-Theatre (GBT), Industrial Management (INM), Personnel Management and Industrial Relations (PIR), Marketing (MK) and Transportation (TN). Through these programs, the School seeks to develop in its students the analytical, decision-making and communication skills required of managers who lead modern organizations.

Admissions

Students who meet Auburn University's admission requirements as stated on page 17 may enter the Pre-Business Program directly from high school. Students also may transfer into the program from another school on campus or from another college or university if they have attained an overall grade point average of at least a C and have completed MH 161 Analytical Geometry and Calculus or the equivalent with a satisfactory grade.

Student Advising System

The Office of Student Affairs of the School of Business is responsible for orienting all new students, freshmen and transferees to the School. All students report each quarter to Student Affairs, Thach 219, to plan their academic schedules and to obtain information.

Faculty members are available to all students for academic counseling and career guidance. Students are encouraged to seek advice on professional and academic questions from department heads and faculty through personal arrangements or appointments made by Student Affairs.

Cooperative Education Program

Business students are eligible to participate in the University's Cooperative Education Program (see page 53). This program allows students to combine academic training with actual business experience.

Dual Degree Program Between the Schools of Business and Engineering

The Dual Degree Program in Business and Engineering at Auburn University is designed to give students the opportunity to prepare a curriculum plan which will result in a Bachelor of Science in Business Administration and a bachelor's degree in an Engineering curriculum.

Students may enter the Dual Degree Program by enrolling either in the School of Business or in the School of Engineering and by declaring an intention to study for this dual objective. An academic adviser is assigned in each School and advising is completed in both areas prior to registration each quarter. At the end of approximately five years of study, students are awarded degrees simultaneously by both Schools.

Pre-Business Program

The requirements of the Pre-Business Program are given in the model below. Students who enter from high school register in this program until they complete all Pre-Business requirements. Students who enter by transfer and who have not yet completed all Pre-Business requirements, must register in the Pre-Business Program.

Before being admitted into a Professional Option Program, business students must complete all courses in the Pre-Business Program with a satisfactory academic record.

Pre-Business Program

FRESHMAN YEAR					
First Quarter			Second Quarter		
MH 140	or MH 160	5	MH 161	An. Geom. & Cal.	5
EH 101	Science*	5	EH 102	English Comp.	3
	HY/AT/EH**	3		HY/AT/EH**	3
	ROTC or Elective	1		ROTC or Elective	1
PE 101	Fnd. of Phys. Ed.	1	PE 102	Begin. Swim. or Group I Course	1
Third Quarter			Fourth Quarter		
MH 151	Finite Math.	5	MH 151	Finite Math.	5
PG 211	Psychology	5	PG 211	Psychology	5
EH 103	English Comp.	3	EH 103	English Comp.	3
	HY/AT/EH**	3		HY/AT/EH**	3
	ROTC or Elective	1		ROTC or Elective	1
PE	Group II course	1	PE	Group II course	1

SOPHOMORE YEAR

EC 200 Economics I.....5	EC 202 Economics II.....5	MT 255 Legal & Soc. Environ...4
SC 211 Public Speaking.....5	MN 274 Statistics I.....5	ACF 212 Intr. Acct. II.....4
MN 207 Data Processing.....2	ACF 211 Intr. Acct. I.....4	EH 315 B & P Report Writing...3
Elective.....3	Elective.....3	ROTC or elective.....1
ROTC or elective.....1	ROTC or elective.....1	Elective††.....5

*Ten hours of Science are required to be selected from any of the following courses: BI 101-102 and/or 103 or BI 101-104, CH 101-102-104 or CH 103-104; GL 101-102; PHS 151-152; PS 200 or 205-206.

**Students may take any combination of World History, HY 101-102-103, Technology and Civilization, HY 204-205-206, History of Art, AT 171-172-173, and Western World Literature, EH 260-261-262.

***May be taken the first or second quarter of student's freshman year. (See page 268 for details.)

†Students who have not taken typewriting in high school are strongly encouraged to take VED 200. For the Office Administration curriculum, now located in the School of Education. See page 132.

††Electives may be from any area, subject to departmental requirements. During the four years of study a minimum of 40 per cent of all hours required for graduation must be taken in Business and Economics and a minimum of 40 per cent in non-business subjects.

Department of Accounting and Finance

Accounting (AC)

A sound knowledge of the fundamentals of accounting is essential to success in any economic endeavor. Accounting is the language of business, and accounting procedures and records are the basic ingredients for sound management decision-making in both business and non-business organizations, including public and philanthropic bodies. Financial reports are required by the Securities and Exchange Commission with the sale of stocks and bonds which form the capital structure of our economic society. They are the basis for determining income taxes due federal and state governments.

The Professional Option Program in Accounting provides broad training in business and financial management. The student is required to take eight accounting courses above the sophomore principles courses, and may elect other courses to provide an emphasis in a particular field of managerial or public accounting.

FRESHMAN AND SOPHOMORE YEAR

(See Pre-Business Program)

JUNIOR YEAR

First Quarter		Second Quarter		Third Quarter	
ACF 311 Inter. Acct. I.....5		ACF 312 Inter. Acct. II.....5		ACF 314 Income Tax.....5	
ACF 310 Mgt. Cost & Bdgt.....4		ACF 361 Prin. of Finance.....5		MT 331 Prin. of Mkt.....5	
MT 241 Business Law I.....4		MN 346 Org. Behavior.....4		MN 382 Mgt. Info. Systems.....4	
MN 310 Prin. of Mgt.....3		MN 380 Prin. Op. Mgt.....3		Elective.....3	

SENIOR YEAR

ACF 410 Cost Acctng.....5	MN 480 Bus. Policies.....5	ACF 416 Auditing.....5
EH 415 Written Bus. Comm.....3	Acct. Elective.....5	ACF 499 Current Topics.....1
Acct. Elective.....5	Humanities Elective* 3-5	Elective.....5
Elective.....5	Elective.....5-3	Elective.....5

TOTAL—207 QUARTER HOURS

Electives should be chosen in consultation with adviser. See catalog course descriptions.

*To be chosen from Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

Finance (FI)

The influence and the responsibilities of financial executives have been expanding dramatically in recent years. Financial officers are involved in the most profound decisions affecting the strategy of business operations. They decide to expand, merge, contract, and change. They are concerned not only with the pricing of products, but with the initial decision to produce them. All aspects of business affairs ultimately reduce to dollar terms, and the financial officers intimate knowledge of the intricacies of financial operations place them in a vital role in corporate management.

The Professional Option Program in Finance offers students an opportunity to specialize in personal and institutional finance. Courses in real estate and insurance are available.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
ACF 361	Prin. of Finance	5	ACF 363	Adv. Bus. Fin.	5	ACF 320	Risk & Ins.	5
ACF 367	Money Mkts. & Fin. Inst.	5	MT 331	Prin. of Mkt.	5	MN 382	Mgt. Info. Systems	4
ACF 310	Mgt. Cost & Bdgt.	4	MN 346	Org. Behavior	4		Elective	5
MN 310	Prin. of Mgt.	3	MN 380	Prin. op. Mgt.	3		Elective	3
			SENIOR YEAR					
ACF 464	Investments	5	ACF 466	Security Analysis	5	MN 480	Bus. Policies	5
EH 415	Written Bus. Comm.	3		Dept. Elective	5		Dept. Elective	5
	Fin. Elective	5		Humanities Elective*	3-5		Elective	5
	Elective	5		Elective	5-3			

TOTAL—207 QUARTER HOURS

Electives should be chosen in consultation with the adviser. See catalog course descriptions.

*To be chosen from Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

Department Of Economics

Business Economics (EC)

Businessmen, public officials, and educators must understand the economic environment in which they live and function if they are to make sound management decisions. The Business Economics Professional Option provides the student with a sound foundation for an administrative or managerial position. The Business Economics curriculum gives the student maximum flexibility in preparing for job opportunities. The foundation provided by the common body of knowledge courses in economics, the other social sciences and business along with selected electives will equip the Business Economics student to work in marketing, management, accounting, or statistics, and in addition, provides excellent preparation for graduate or professional studies. (See also Economics Major in the School of Arts and Sciences.)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR			
First Quarter		Second Quarter	
EC 551	Inter. Micro-economics.....5	ACF 361	Prin. of Finance.....5
MN 310	Prin. Mgt.....3	EC 556	Inter. Macro-economics.....5
MN 346	Org. Behavior.....4		Humanities Elective* 5-3
	Humanities Elective* 3-5		
	Elective.....3		
SENIOR YEAR			
EH 415	Written Bus. Comm.....3	EC 554	Hist. Ec. Thought.....5
MN 380	Prin. Oper. Mgt.....3	MN 382	Mgt. Info. Sys.....4
	Dept. Elective.....5		Dept. Elective.....5
	Dept. Elective.....5		
MT 331	Prin. of Mkt.....5	MN 480	Bus. Policies.....5
	Humanities Elective*.....5		Dept. Elective.....5
	Dept. Elective.....5		Elective.....5
	Elective.....3		
TOTAL—201 QUARTER HOURS			

Economics departmental electives are any EC designated courses except EC 206.

*To be selected from Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

Department of Management

The success or failure of any business is dependent upon the quality of its management. Business managers must acquire and effectively utilize physical, financial, and human resources to ensure an organization's survival and growth. In order to make sound decisions, the manager must be knowledgeable in basic business functions as well as the process of management.

The professional options within the management department are designed to impart knowledge which will assist future managers to be good decision makers for their organizations.

General Business (GB)

The General Business Professional Option focuses on the management of the functional areas inherent in business operations. It provides a number of elective courses which permit students to develop a concentration in a specific area or to broaden their education in several functional areas.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR			
First Quarter		Second Quarter	
MT 331	Prin. of Mkt.....5	MN 346	Org. Behavior.....4
MN 310	Prin. of Mgt.....3	MN 380	Prin. Oper. Mgt.....3
ACF 310	Mgt. Cost & Bdgt.....4		Humanities Electives*.....5
	Humanities Elective*.....5		Elective.....5
SENIOR YEAR			
MN 442	Personnel Mgt.....5	EH 415	Written Bus. Comm.....3
MN 382	Mgt. Info. Sys.....4		Business Elective**.....5
	Elective.....5		Business Elective**.....5
	Elective.....3		Elective.....5
MT 331	Prin. of Mkt.....5	MN 480	Bus. Policies.....5
	Humanities Elective*.....5		Dept. Elective.....5
	Dept. Elective.....5		Elective.....3
	Elective.....3		Elective.....3
TOTAL—207 QUARTER HOURS			

*Humanities Electives must be selected from Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

**Business electives must be selected from the 300, 400 or specified 500 level course offerings of the School of Business.

Industrial Management (INM)

The Professional Option Program in Industrial Management concentrates on manufacturing businesses. It requires study in computer applications, quantitative methods, human relations, management, and the utilization of these studies in management decision-making. Also, the student is permitted some free electives which he may use to study areas outside the School of Business.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
MT 331	Prin. of Mkt.	5	ACF 361	Prin. of Fin.	5	MN 381	Mgt. D.M.	5
ACF 310	Mgt. Cost & Budgt.	4	MN 346	Org. Behavior	4	MN 385	Prod. Mgt.	5
MN 310	Prin. of Mgt.	3	MN 380	Prin. Op. Mgt.	3		Human Elective*	5
TS 100	Intr. Mfg. Proc.	2	TS or	TE Elective	1	TS or	TE Elective**	1
	Humanities Elective*	3		Humanities Elective*	3			
			SENIOR YEAR					
MN 500	Ind. Relations	5	MN 484	Oper. Mgt.	5	MN 480	Bus. Policies	5
MN 382	Mgt. Info. System	4	EH 415	Written Bus. Comm.	3		Dept. Elective***	5
MN 386	Mtl. Mgt.	3		Dept. Elective***	5		Dept. Elective***	5
	Dept. Elective***	5		Elective	5		Humanities Elective*	3

TOTAL—207 QUARTER HOURS

*Humanities Electives must be selected from Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

**To be selected from TS 111, 112, 113, 114, 115 or TE 101.

***Departmental Electives must be selected from an approved list in the Office of Business Student Affairs

Personnel Management and Industrial Relations (PIR)

The Personnel Management and Industrial Relations Program prepares students for managing personnel and industrial relations activities. It blends a variety of subject matter into decision-making patterns that may be used to work with individual employees and unions. In addition, the program provides some free electives. Students should take SY 201 for five of their elective hours in Pre-Business.

FRESHMAN AND SOPHOMORE YEAR

(See Pre-Business Program)

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
MT 331	Prin. of Mkt.	5	MN 442	Personnel Mgt.	5	MN 382	Mgt. Info. Sys.	4
EC 350	Labor Economics	5	ACF 361	Prin. of Finance	5	MN 500	Ind. Relations	5
MN 310	Prin. of Mgt.	3	MN 346	Org. Behavior	4	MN 545	Pers. Organ. Res.	3
	Humanities Elective*	5	MN 380	Prin. Op. Mgt.	3		Elective	5
			SENIOR YEAR					
MN 501	Labor Rel. Law	5	MN 502	Labor-Mgt. Rel.	3	MN 480	Bus. Policies	5
MN 550	Pers. Select. & Pl.	3	MN 551	Manpower Plan	3	MN 447	Employee Comp.	3
	Elective	5	MN 546	Pers. Adm. Leg.	3	MN 503	Labor Arbit.	3
	Humanities Elective*	5		Dept. Elective**	3	EH 415	Written Bus. Comm.	3
				Dept. Elective**	3		Elective	3

TOTAL—207 QUARTER HOURS

*Humanities Electives must be selected from Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

**Departmental Electives must be selected from the 300, 400 or specified 500-level course offerings of the Department of Management.

General Business—Theater (GBT)

The General Business Theater Professional Option is an interdepartmental program between the Management Department and the Department of Theater which is administered by the School of Business. It permits students who wish to work in professional theater to be well grounded in business management and thus able to utilize business skills while developing their theatrical careers. With few exceptions this option follows the General Business format.

FRESHMAN & SOPHOMORE YEARS

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra	5	MH 161	An. Geom. & Cal.	5	MH 151	Finite Math	5
	Science	5		Science	5	TH 207	Stage Make-up	3
EH 101	English Comp.	3	EH 102	English Comp.	3	TH 309	Costume	3
TH 104	Intr. Theatre I	3	TH 105	Intr. Theatre II	3	EH 103	English Comp.	3
TH 107	Stage Craft I	1	TH 108	Stage Craft II	1	TH 106	Intr. Theatre III	3
PE 101	Physical Education	1	PE 102	Physical Education or Group 1	1	TH 109	Stage Craft III	1
						PE	Group 2	1
EC 200	Economics I	5	EC 202	Economics II	5	SC 220	Fund. Oral Interp.	5
MN 207	Data Processing	2	EC 274	Bus. & Ec. Statistics	5		of Lit.	5
PG 212	Psychology	3	ACF 211	Prin. of Acct. I	4	ACF 212	Prin. of Acct. II	4
TH 301	Theatre in Western	3	TH 302	Theatre in Western	3	TH 303	Theatre in Western	3
	Civiliz.	3		Civiliz.	3		Civiliz.	3
TH 111	Theatre Prac.	1	TH 111	Theatre Prac.	1	EH 315	Report Writing	3
						TH 111	112	2

JUNIOR & SENIOR YEAR FOCUSES

TECHNICAL FOCUS

MT 331	Prin. of Mkt.	5	MN 346	Org. Behavior	4	ACF 361	Prin. of Finance	5
TH 304	Fund. Stage Des.	5	MN 380	Prin. Op. Mgt.	3	MT 255	Legal & Social Envrn.	4
ACF 310	Mgt. Cost & Budg.	4	TH 305	Design in Theatre I	3	TH 306	Design in Theatre II	3
MN 310	Prin. of Mgt.	3	TH 221	Adv. Tech. Prod.	3	TH 326	Stage Light	3
				Business Elective*	5	TH 111	112	2
MN 442	Person Mgt.	5	EH 415	Written Bus. Comm.	3	MN 480	Bus. Policies	5
MN 382	Mgt. Info. Systems	4	TH 322	Costume Design	3	TH 323	Cost. Patt. & Const.	3
TH 321	Costume History	3		Business Elect.*	5	TH 432	Scene Painting	3
TH 221	Adv. Tech. Prod.	3		Business Elect.*	5		Elective	3
							Elective	3

PERFORMANCE FOCUS

MT 331	Prin. of Mkt.	5	TH 205	Act. Fund. II	5	ACF 361	Prin. of Fin.	5
TH 204	Act. Fund. I	5	MN 346	Org. Behavior	4	TH 206	Act. Fund. III	5
ACF 310	Mgt. Cost & Budg.	4	MN 380	Prin. Op. Mgt.	3	MT 255	Legal & Social Envrn.	4
MN 310	Prin. of Mgt.	3	TH 112	Act., Reh. & Perform.	3	TH 111	112	2
				Business Elective*	5			
MN 442	Person Mgt.	5	EH 415	Written Bus. Comm.	3	MN 480	Bus. Policies	5
MN 382	Mgt. Info. Systems	4	TH 405	Dir. Funds. II	3	TH 406	Dir. Funds. III	3
TH 401	Play Analysis	3		Business Elect.*	5	TH 307	Children's Theatre	3
TH 404	Dir. Funds. I	3		Business Elect.*	5		Elective	3
							Elective	3

TOTAL—207 QUARTER HOURS

*Business electives must be selected from the 300, 400, or specified 500 level course offerings of the School of Business.

Department of Marketing and Transportation

Marketing and Transportation are critical in the effective operation of business in the free world. Students gain the foundation to understand the entire corporate philosophy which affects every phase of the business programs—from initial product conception to the delivery of satisfaction to the final customer. Marketing majors discover the interrelationship of marketing to other management tools and prepare themselves for such careers as sales, advertising, marketing research, product planning, and merchandising. Transportation majors complete a course of study which prepares them for

careers in carrier, physical distribution, and industrial traffic management and for assignments in regulating agency administration, in urban transportation and development planning, and as traffic and transportation specialists.

Marketing (MK)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

First Quarter	
ACF 361	Prin. of Finance5
MT 331	Prin. of Marketing5
SY 201	Sociology5
MN 310	Prin. of Mgt.3

Second Quarter	
MT 336	Quan. Anal. Mkt.5
MT 341	Consumer Behavior5
MN 382	Mgt. Info. Sys.4
MN 380	Prin. of Oper. Mgt.3

Third Quarter	
MT 436	Mkt. Research5
	Dept. Elective†5
	Humanities Elect.*3-5
	Elective5-3

MN 346	Orgn. Behavior4
EH 415	Written Bus. Comm.3
	Dept. Elective†5
	Elective5

SENIOR YEAR	
MN 480	Business Policies5
	Dept. Elective†5
	Directed Elective‡5
	Elective2

MT 498	Marketing Strategy5
	Elective5
	Elective5

TOTAL—207 QUARTER HOURS

Transportation (TN)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program)

JUNIOR YEAR

First Quarter	
ACF 361	Prin. of Finance5
MT 372	Eco. of Transp.5
PO 209	American Government5
MN 310	Prin. of Mgt.3

Second Quarter	
MT 331	Prin. of Mkt.5
MT 473	Phys. Dist. Mgt.5
MN 382	Mgt. Info. Sys.4
MN 380	Prin. Oper. Mgt.3

Third Quarter	
MT 475	Transp. Reg. Ind.5
	Dept. Elective†5
	Humanities Elective*3-5
	Elective5-3

MN 346	Orgn. Behavior4
EH 415	Written Bus. Comm.3
	Dept. Elective†5
	Elective5

SENIOR YEAR	
MT 476	Transp. Ent. Mgt.5
	Directed Elective‡5
	Elective5
	Elective2

MN 480	Business Policies5
	Directed Elective‡5
	Elective5

TOTAL—207 QUARTER HOURS

†Departmental Electives may be chosen from the following lists according to student career goals:

Marketing: MT 337, 372, 432, 433, 434, 436, 437, 438, 440, 473, 581, 582, 483, ACF 310.

Transportation: MT 336, 337, 434, 437, 438, 440, 474, 477, 484, ACF 310.

‡Directed Electives may be chosen from business or non-business courses according to career goals upon approval of departmental advisers.

*To be chosen from Economics, Foreign Language, History, Literature, Philosophy, Political Science, Psychology, or Sociology courses.

School of Education

JACK E. BLACKBURN, *Dean*

J. BOYD SCEBRA, *Associate Dean*

RICHARD W. WARNER, JR., *Associate Dean*

TRUMAN M. PIERCE, *Dean Emeritus*

THE SCHOOL OF EDUCATION is accredited by the National Council for Accreditation of Teacher Education for the preparation of teachers and school service personnel with the doctor's degree as the highest degree approved.

Professional preparation programs are provided for service in the fields of curriculum and teaching; administration and supervision; counselor education; and educational media. Graduate programs administered by the Graduate School lead to the degrees of Master of Education, Master of Science, Specialist in Education, and Doctor of Education. Programs for the preparation of personnel for social service and education related agencies are also provided with degree options through the doctorate.

Emphasis in all programs is upon the preparation of personnel who will be able to meet successfully the performance demands of the roles they assume in their professional positions. An effort is made through processes of Continuous Program Renewal to revise constantly programs based upon systematic evaluative-feedback data secured on the performance of graduates on the job.

Undergraduate Curricula

Non-teaching programs, such as Office Administration, Rehabilitation Services, and Recreation Administration, are offered in the School of Education. These programs have different requirements from those listed in this section of the Bulletin. Students interested in these areas should consult with their adviser or the School of Education Student Personnel Office.

The following statements set forth requirements for the development of programs for students pursuing a teacher education curriculum. Scholastic requirements, requirements for the pre-professional program, the program of professional education, and the fields of teaching specialization are stated. A total of 210 quarter hours is required to complete the program which leads to the degree of Bachelor of Science in Education.

Scholastic Requirements

Students enrolled in the School of Education or those enrolled in other Schools who are pursuing the dual objectives program must meet the following scholastic requirements: a grade point average of 2.2 (on a 4 point scale) for admission to Teacher Education and a grade point average of 2.2 in all courses attempted in professional education and in the teaching major and minor for admission to the professional internship.

General Studies Requirements

The pre-professional program as outlined fulfills the liberal arts requirement for students preparing to enter a teacher preparation program leading to

professional certification as a teacher in elementary and/or secondary schools. A major portion of the pre-professional requirements will be completed prior to admission to the teacher education program.

English

EH	101-102-103	English Composition (3-3-3)	9
SC	202	Applied Speech Communication (3) or approved substitute...	3
		Literature (American, English or World)*	6
		Literature (American, English or World)	9

Social Science

HY	101-102-103	World History (3-3-3)	9
	or		
HY	204-205-206	Technology and Civilization (3-3-3)	9
SY	201	Introduction to Sociology (5)	5
		Approved Social Science electives selected from Economics, Geography, History, Political Science, Psychology, and Sociology*	10-15

Biological Science

BI	101	Prin. of Biology (5)	5
BI	102	General Plant Biology (5)**	
BI	103	General Animal Biology (5)	Select 1
BI	104	Biology in Human Affairs (5)	5
ZY	250	Human Anatomy (5)***	

Physical Science

CH	101-102-103L	General Chemistry (2-2-1)	
		or CH 103-104	
PS	200	Fnds. of Physics (5)****	
GL	101-102	Intr. Geology (5)	
AM	304	Meteorology (5)	Select 2
AY	310	Earth Science (5)	10
PHS	100-101	Physical Science (5-5)†	
PHS	151-152	Physical Science (5-5)	

Mathematics

		Approved Math Course (5)	5
MH	281-282-283	(5-5-3)‡	13
MH	281-282	(5-5)	10

Physical Education

PE	101-102 or Group I, Group II	(1-1-1)	3
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*Early Childhood Education majors (ECEH)

**Early Childhood and Elementary Education majors complete 15 hours

***Science Education majors and minors

****Health and Physical Education majors

†Early Childhood, Elementary and Special Education majors (BD, ECH, MR)

‡Elementary and Special Education majors (BD, MR)

Professional Requirements

This phase of the Teacher Education Program develops competence in the content and skills of professional teacher education. It is divided into two components: a Professional Education Core and the Area of Professional Specialization.

Professional Education Core

The Professional Core is designed to assist the student in developing, clarifying, and enhancing competencies, understandings, skills, and values

which contribute to successful performance by all teachers. The Professional Core has general applicability and is required of all students in teacher preparation programs. Professional Core experiences are drawn from several sources of professional study including general curriculum and instruction, educational psychology, educational measurement, administration and supervision, media, and counselor education.

Program for students beginning study prior to summer quarter 1978.

Career Exploration and Planning (2)	2
Transfer Orientation (1)	1
Introduction to Laboratory Experience for Transfers (1)	1
FED 213 Human Development (5)	5
FED 214 Psychological Foundations of Education (5)	5
FED 320 Social Foundations of Education (5)	5
FED 480 Philosophical Foundations of Education (5)	5
Total—22 hours	

Program for students beginning study after spring quarter 1978.

*IED 101 Career Exploration and Planning (1)	1
EM 200 Educational Media (2)	2
CED 322 Human Relations Training in Teacher Education (2)	2
FED 300 Educational Psychology (5)	5
FED 350 Cultural Foundations of Education (5)	5
FED 400 Measurement and Evaluation in Education (5)	5
EDL 481 Organization, Administration, and Financing of American Public Education Systems (2)	2
*Transfers will complete departmental orientation course (1)	1
Total—22 hours	

Area of Professional Specialization

This phase of the teacher preparation program is designed to assist the student in acquiring the knowledge, understanding, and skills deemed essential for success in the different specializations. Curriculum development, methodology, teaching and learning resources, and evaluation of teaching effectiveness are emphasized in the various areas of specialization. Each student in the teacher preparation program will complete the courses listed under the school program in which he is preparing to teach. Admission to Teacher Education is a prerequisite for those courses which have one asterisk (*) before them.

EDUCATIONAL MEDIA

(School Library and Audio-Visual Personnel)

Minor: 28 Hours

EM 300 Learning Resources	4
EM 510 Media for Children	4
EM 515 Media for Young Adults	4
EM 530 Reference Materials and Services	4
EM 540 Organization and Administration of Media Services	4
EM 550 Classification and Cataloging of Media	4
EM 495 Practicum in Media Service	4

ELEMENTARY EDUCATION

A. EARLY CHILDHOOD EDUCATION

*EED 304 Music and Related Arts	5
*EED 320 Curriculum for Early Childhood Education I	10
*EED 420 Curriculum for Early Childhood Education II	10

Major: 63 Hours

AT 301 Elementary School Art	5
EED 300 Fundamentals of Reading Instruction	5
EM 510 Media for Children	4
FCD 267 Child Development I: Principles and Theories	4
FCD 467 Parent Education	4
FCD 268 Family Structure I	5
HPR 211 Sensorimotor Activities	3
MU 371 Introduction to Music	3
SC 273 Group Problem Solving Through Discussion	5
SC 550 Principles of Speech Correction	5
TH 307 Children's Theatre	
TH 308 Creative Dramatics	3
Approved Electives	17

B. ELEMENTARY EDUCATION

*EED 302 Curriculum I: Language Arts	5
*EED 303 Curriculum I: Social Science	5
*EED 304 Music and Related Arts	5
*EED 402 Curriculum II: Mathematics	5
*EED 403 Curriculum II: Natural Science	5

Major: 48 Hours

AT 301	Elementary School Art	5
EED 300	Fundamentals of Reading Instruction	5
EM 510	Media for Children	4
HPR 212	Elementary School Activities	3
HPR 394	Elementary School Health Instruction	3
MU 371	Introduction to Music	3
SC 550	Principles of Speech Correction	5
	Approved Concentration	20

Health, Physical Education, Recreation**A. HEALTH EDUCATION**

HPR 414A	Teaching in Elementary Schools and Secondary Schools, and	
HPR 423A	Program in Area of Specialization (Major Field)	6
	*Minor Field	3

Minor: 31 Hours

HPR 195	Health Science	3
HPR 295	School and Community Health	3
HPR 394	Elementary School Health Instruction or	
HPR 395	Secondary School Health Instruction	3
HPR 396	Drug Use and Abuse	3
HPR 494	Emergency Care and First Aid	3
NF 112	Nutrition and Man	3
NF 358	Community—Family Health	3
	Approved health electives	10

Major: 52 Hours

Minor Requirements		31
EH 141	Medical Vocabulary	3
IED 376	Survey of Exceptionality	5
ZY 251	Physiology	5
	Approved health elective	8

B. HEALTH AND PHYSICAL EDUCATION

*HPR 414B	Teaching in Elementary and Secondary Schools, and	
*HPR 423B	Program in Area of Specialization (Major Field)	6
	*Minor Field	5

Major: 56 Hours**Skills and Concepts Courses:**

HPR 118	Skills and Concepts of Individual and Dual Activities I	3
HPR 119	Skills and Concepts of Individual and Dual Activities II	3
HPR 120	Skills and Concepts of Gymnastics	4
HPR 121	Skills and Concepts of Aquatics	2
HPR 122	Skills and Concepts of Team Sports	3
HPR 123	Skills and Concepts of Dance	4
HPR 195	Health Science	3
HPR 201	History and Principles of Physical Education	3
HPR 212	Elementary School Activities	3
HPR 295	School and Community Health	3
HPR 315	Kinesiology*	4
HPR 316	Evaluation and Measurement in Physical Education	3
HPR 395	Secondary School Health Instruction	3
HPR 405	Physiology of Exercise**	4
HPR 424	Intramurals and Officiating	3
HPR 494	Emergency Care and First Aid	3
ZY 251	Physiology	5

*Prerequisites: ZY 250-251, PS 200

**Prerequisites: ZY 250-251

C. HEALTH, PHYSICAL EDUCATION, RECREATION COMPOSITE MAJOR-MINOR

See above for Major Field 6

Composite: 77 Hours

Major Requirements (Health and Physical Education)		56
HPR 282	Principles of Recreation	3
HPR 386	Recreation Leadership	3
HPR 416	Adaptive Physical Education	3
HPR	Approved Elective in Health or Physical Education	3

HPR	Teaching and Coaching (choice of 1 course) HPR 202, 203, 204, 206, 207, 208, 209, 210, 351	3
HPR	Approved elective in Health Education	3
HPR	Approved elective in Recreation	3

D. RECREATION ADMINISTRATION: This program does not require admission to Teacher Education

HPR 423C	Program in Area of Specialization	5
SED 405	Teaching in Secondary Schools, or	
SED 410	Program in Secondary School (Minor Field) or	
IED or VED 415	Teaching in Elementary and Secondary Schools	
IED or VED 414	Program in Elementary and Secondary Schools	

MINOR: 30 HOURS

HPR 282	Principles of Recreation	3
HPR 386	Recreation Leadership	3
HPR 387	Outdoor Recreation	3
HPR 388	Camp Management	3
HPR 494	Emergency Care and First Aid	3
	Approved Electives	15

Composite Major: 98-100 Hours**Basic Core for A and B Options (68 hours)**

Minor Requirements (Excluding approved electives)		15
HPR 486	Park Planning	3
ACF 211	Principles of Accounting I	4
ACF 212	Principles of Accounting II	4
RSY 362	Community Organization	5
MN 310	Principles of Management	5
MN 344	Environmental Law	4
MN 442	Personnel Management	5
JM 315	Technical Journalism	3
HPR 423C	Recreation—Program & Administration	5
HPR 425C	Professional Internship	15

In addition to completing the Basic Core, students select one of the options below:

A. Recreation Program Leadership (30-31 hours)

HPR 118	Individual & Dual Activities I	3
HPR 119	Individual & Dual Activities II	3
HPR 120	Gymnastics	4
HPR 121	Aquatics (or HPR 351 Water Safety)	2-3
HPR 122	Team Sports	3
HPR 123	Dance	4
CA 345	Creative Crafts	2
TH 315	Recreational Dramatics (or TH 307/TH 308)	3
HPR 424	Intramurals and Officiating	3
HPR 485	Social Recreation	3

B. Recreation Resource Management (32 hours)

HPR 389	Recreation Interpretative Services	3
HPR 487	Park Management	3
ZY 206	Conservation in the U. S.	3
FY 460	Wildland Recreation Philosophy & Policy	3
HF 221	Landscape Gardening (Pr. BI 102)	5
	Approved Electives	15

Rehabilitation and Special Education

All Special Education majors are required to take the following Special Education Core courses:

RSE 102	Orientation for Transfer Students	1
RSE 104	Orientation to Lab. Exper. for Transfers	1
RSE 376	Survey of Exceptionality	5
RSE 420	Org. Instruction for Spec. Ed.	5
RSE 550	Language Dev. for the Young Handicapped Child	5

A. EARLY CHILDHOOD EDUCATION FOR THE HANDICAPPED**Major: 90 Hours**

EED 300	Fund. of Reading Instr.	5
EED 304	Music and Related Arts*	5
EED 320E	Curriculum for Early Childhood Ed. I*	10
EED 420E	Curriculum for Early Childhood Ed. II*	10
FCD 267	Child Dev. I: Prin. and Theories	4
FCD 270	Family I: Struct. and Funct. of the Family	5
FCD 300	Approaches to Child Study	5
HPR 211	Sensorimotor Activities	3
MU 371	Introduction to Music	3
AT 301	Elementary School Art	5
RSE 377	Intr. to Mental Retardation or	
RSE 378	An Intr. to Behav. Disturb. or	
RSE 529	Learn. Disabilities	5
RSE 425S	Professional Internship	15
RSE 479S	Materials and Methods for Teaching in Spec. Ed.*	5
	Approved Electives	10

B. EMOTIONAL DISTURBANCE**Major: 90 Hours**

AT 301	Elementary School Art or	
AT 401	Art in Education	5
EED 300	Fund. of Read. Instr.	5
EED 302C	Curriculum I: Language Arts*	5
EED 303C	Curriculum I: Social Science*	5
EED 304	Music and Related Arts*	5
EED 396	Music for the Elem. Teacher or	
MU 371	Intr. to Music	3
EED 402C	Curriculum II: Mathematics*	5
EED 403C	Curriculum II: Nat. Sci.*	5
HPR 211	Sensorimotor Activities	3
PG 535	Behavior Pathology	4
RSE 378	An Intr. to Behav. Disturb.	5
RSE 4250	Professional Internship	15
RSE 4790	Materials and Methods for Teach. in Spec. Ed.*	5
RSE 529	Learning Disabilities	5
	Approved Electives	15

C. MENTAL RETARDATION**Major: 93 Hours**

AT 301	Elem. School Art or	
AT 401	Art in Education	5
EED 300	Fund. of Read. Instr.	5
EED 302D	Curriculum I: Language Arts*	5
EED 303D	Curriculum I: Social Science*	5
EED 304	Music and Related Arts*	5
EED 396	Music for the Elem. Teach. or	
MU 201	Fund. of Music or	
MU 371	Intr. to Music	3
EED 402D	Curriculum II: Mathematics*	5
EED 403D	Curriculum II: Nat. Sci.*	5
HPR 517	Phys. Ed. for the Mentally Retard.	3
RSE 377	Intr. to Mental Retard.	5
RSE 425P	Professional Internship	15
RSE 479P	Materials and Methods for Teach. in Spec. Ed.*	5
RSE 529	Learning Disabilities	5
RSE 586	The Severely Mentally Retarded	5
	Approved Electives	17

D. SPEECH PATHOLOGY**Composite Major: 98 Hours**

Completion of this program meets pre-professional certification requirements of the American Speech and Hearing Association. Additional work required: 200 clock hours in an approved Speech and Hearing Clinic or under the supervision of a certified Speech Pathologist.

SC 340	The Speech and Hearing Mech.	5
SC 341	Phonetics	3
SC 350	Introduction to Speech Path-Aud	5

SC 455-458	Clinical Procedures	6
SC 551	Articulation Disorders	5
SC 552	Language Disorders	5
SC 553	Fluency Disorders	5
SC 554	Voice Disorders	5
SC 560	Intr. to Aud.	5
SC 561	Hearing Pathology	5
SC 562	Hearing Rehab.	5
CED 521	Intr. to Guid. and Counsel.	4
RSE 425N	Professional Internship	15
RSE 479N	Methods & Materials for Teach. in Spec. Ed.*	5

Completion of A, B, C, or D or

**A Combination of Courses from the 4 Areas
Select a Minimum of 20 or a Maximum of 30**

A. FAMILY AND CHILD DEVELOPMENT

FCD 157	Family and Human Development	5
FCD 204	Dynamics of Marriage	3
FCD 267	Child Development I	4
FCD 268	Family I	4
FCD 300	Approaches to Child Study	5
FCD 301	Child Development II	4
FCD 302	Child Development III	4
FCD 305	Family II	4
FCD 306	Family III	4
FCD 308	The Family and Child Mental Health	4
FCD 467	Parent Education	4

B. EMOTIONAL DISTURBANCE

RSE 378	Intr. to Behav. Disturb.	5
RSE 4790	Teaching Behavior Disturbed	5
RSE 580	Children with Special Learn. Disabil.	5
PG 535	Behavior Pathology	4
PG 350	Behav. Modifi. for Early Childhood	5

C. MENTAL RETARDATION

RSE 377	Intr. to Mental Retard.	5
RSE 479P	Teaching Mentally Retarded	5
RSE 586	Severely Retarded	5
VED 537	Voc. Training of Mental. Retard.	5
HPR 517	P.E. for Mentally Retarded	5
HPR 211	Sensorimotor Activities	3

D. PSYCHOLOGY

PG 211	Psychology	5
PG 212	Psychology	3
PG 215	Quantitative Methods	5
PG 320	Exper. Psycho. I: Learning	4
PG 330	Social Psychology	5
PG 350	Behav. Mod. in Early Childhood	5
PG 535	Behavior Pathology	4
PG 515	Intr. to the Theory of Measur.	5

REHABILITATION SERVICES EDUCATION: This program does not require admission to Teacher Education.

Major: 56 Hours

VED 330	Careers in Rehab.	5
PG 212	Intr. to Psychology II	3
ANT 305	Culture and Personality	3
SY 375	Intr. to Social Welfare	5
ZY 105	Human Physiology	5
SC 273	Group Prob. Solv. Through Discuss.	5
CED 521	Guidance in the Public Schools	5
	Approved Electives in Area of Special	25

Secondary Education

SED 405	Teaching in Sec. School, or*	
IED 414	Teaching in Elem. and Sec. Schools (Major Fields, except English)*	3

SED 410	Program in Sec. School, or*	
IED 423	Program in Elem. and Sec. Schools (Major Field, except English)*	3
SED 405	Teaching in Secondary School, or*	
SED 410	Program in Secondary School (Minor Field) or*	
IED, HPR, or VED 415	Teaching in Elementary and Secondary School, or*	
IED, HPR, or VED 414	Program in Elementary and Secondary Schools (Minor Field)*	3
SED 411, SED 412, and SED 413 are required in major for students in English education.*		

ART EDUCATION**Composite Major: 80 Hours**

AT 111	AT 112, AT 113* Fundamentals	15
AT 121	AT 122, AT 123** Fundamentals	15
AT 171	AT 172, AT 173 History World Art	9
AT 211	Basic Figure Drawing	5
	Painting	10
AT 231	Oil Painting (5) or	
AT 232	Trans. Water Color (5) or	
AT 233	Opaque Water (5)	
	Sculpture	5
AT 251	Model Construction (5) or	
AT 252	Wood Sculpture (5) or	
AT 253	Stone Sculpture (5)	
	Printmaking	5
AT 241	Relief Printmaking (5) or	
AT 242	Intaglio Printmaking (5) or	
AT 243	Planographic Printmaking (5)	
AT 301	Elementary School Art	5
	Approved Electives	11

*Prerequisites: AT 111 and AT 112

**Prerequisites: AT 121 and AT 122

DRAMATIC ARTS**Minor: 33 Hours**

TH 104	Intr. to Theatre I	3
TH 105	Intr. to Theatre II	3
TH 106	Intr. to Theatre III	3
TH 107	Stage Craft I	1
TH 108	Stage Craft II	1
TH 109	Stage Craft III	1
TH 204	Fund. of Acting I: Voice	5
TH 205	Fund. of Acting II: Movement	5
TH 207	Stage Make-Up	3
TH 304	Fund. of Stage Design	5
TH 404	Directing I	3

Major: 56 Hours

	Minor Requirements	33
TH 201	Theatre Artists in Society	3
TH 301	Theatre in Western Civilization	3
TH 302	Theatre in Western Civilization	3
TH 303	Theatre in Western Civilization	3
TH 307	Children's Theatre or	
TH 308	Creative Dramatics	3
TH 309	Costume	3
TH 405	Directing II	5

ENGLISH**Minor: 30 Hours**

EH 393	Intr. to Study of English Language	5
EH 357	Survey of American Literature or	
EH 358	Survey of American Literature	5
	Approved Elective in English (300-500 level)	5
SED 501	Language Study for Teachers	5
SED 502	Rhetoric and Composition for Teachers	5
SED 575	Problems in the Improvement of Reading at the Secondary School level	5

Composite Major**Basic Core—40 hours**

EH 594	Introduction to Linguistics or	
EH 541	History of the English Language	5
SED 501	Language Study for Teachers	5

SED 575	Problems in Improvement of Reading at the Secondary School Level	5
SED 576	Reading of Adolescents	5
EH 390	Advanced Composition	5
SED 502	Rhetoric and Composition for Teachers	5
EH 357	Survey of American Literature or	
EH 358	Survey of American Literature	5
EH 551	Shakespeare or	
EH 552	Shakespeare	5

In addition to completing the Basic Core, students select one of the options below:

1 English/Language and Literature—47 hrs.

	Approved English electives (literature)	20
	Approved English electives (non-literature)	5
	Approved Auxiliary courses (Selected from at least two of the following areas: English, Journalism, Reading, Educational Media, Speech Communication, Theatre, Foreign Languages, History, Religion, Philosophy, Sociology, Psychology, Art, Music)	22

2 English/Journalism—46 hrs.

	Approved English electives, 300-500 level	20
JM 101	Newspaper Style	1
JM 221	Beginning News Writing	3
JM 223	Reporting	3
JM 224	Copyreading and Editing	3
JM 321	Newspaper Makeup and Layout	3
JM 322	Feature Writing	3

(10 additional hours selected from)

JM 323	Community Newspaper	5
JM 435	Magazine Editing and Production	5
JM 465	History and Principles of Journalism	5

3 English/Educational Media—48 hrs.

	Approved English electives, 300-500 level	20
EM 300	Learning Resources	4
EM 510	Media for Children	4
EM 515	Media for Young Adults	4
EM 530	Reference Materials and Services	4
EM 540	Organization and Administration of Media Centers	4
EM 550	Classification and Cataloging of Media	4
EM 495	Practicum in Media Services	4

4 English/Speech Communication—47 Hrs.

	Approved English electives, 300-500 level	20
SC 200	Introduction to Undergraduate Study in Speech Communication	5
SC 201	Speech Communication Theories	5
SC 220	Fundamentals of Oral Interpretation of Literature	5
SC 273	Group Problem Solving Through Discussion	5
SC	elective	5
SED 201P	Education: Communication Problems	2

5 English/Dramatic Arts—47 hrs.

	Approved English electives, 300-400 level	20
TH 107	Stagecraft I	1
TH 108	Stagecraft II	1
TH 109	Stagecraft III	1
TH 204	Fundamentals of Acting I: Voice	5
TH 205	Fundamentals of Acting II: Movement	5
TH 207	Stage Make-up	3
TH 304	Fundamentals of Stage Design	5
TH 404	Directing I	3
TH	elective	3

6 English/Foreign Language—47 hrs.

	Approved English electives, 300-400 level	20
	Approved courses in Spanish, French or German	27

7 English/Secondary Reading—48 hrs.

	Approved English electives, 300-500 level	20
EED 561	Individualizing the Classroom Reading Program	5
EM 515	Media for Young Adults	4
SED 570	Reading in the Content Areas of Secondary School	5
SED 201R	Education: Improvement of Reading	2
SED 201P	Education: Problems in Communication	2
SED 495	Practicum in Secondary School Reading	5
	Approved Electives	5

8. English/Comparative Literature—48 hrs.

Comparative Literature, to be selected from the following courses.....30

EH 312	The European Novel	.....	5
EH 325	The Short Story	.....	5
EH 340	The Classical Background	.....	5
EH 571	Renaissance and Baroque	.....	5
EH 573	Romanticism	.....	5
EH 574	Realism to Naturalism	.....	5
EH 575	The Symbolist Movement in Literature	.....	5
FL 371-372-373	Survey of Russian Literature in Translation	.....	18

Approved auxiliary courses (Foreign Language, History, Philosophy, Religion, Psychology, Art History, Music History, Sociology).....18

FOREIGN LANGUAGES**A. Spanish****Minor: 33 Hours**

FL 131	Spanish	.....	5
FL 132	Spanish	.....	5
FL 133	Spanish	.....	5
FL 231	Spanish	.....	5
FL 232	Spanish	.....	5
FL 233	Spanish	.....	5
	Approved 300 level course	.....	3

Major: 51 Hours

Minor Requirements	.....	33
Approved 300-500 level courses	.....	18

B. German**Minor: 33 Hours**

FL 151	German	.....	5
FL 152	German	.....	5
FL 153	German	.....	5
FL 251	German	.....	5
FL 252	German	.....	5
FL 253	German	.....	5
	Approved 300 level course	.....	3

Major: 51 Hours

Minor Requirements	.....	33
Approved 300-500 level courses	.....	18

C. French**Minor: 33 Hours**

FL 121	French	.....	5
FL 122	French	.....	5
FL 123	French	.....	5
FL 221	French	.....	5
FL 222	French	.....	5
FL 223	French	.....	5
	Approved 300 level course	.....	3

Major: 51 Hours

Minor requirements	.....	33
Approved 300-500 level courses	.....	18

Foreign Language/English Composite**Major: 81 Hours**

	Foreign Language Major	51
SED 501	Language Study for Teachers	.....	5
SED 502	Rhetoric & Composition for Teachers	.....	5
	Approved English courses in European literature	.....	10
	Approved English courses in American or English literature	.....	10

MATHEMATICS

Any 5 hour mathematics course in the minor, majors, or composites may be counted as fulfilling the pre-professional mathematics requirement.

Minor: 31-34 Hours

MH 161	Analytic Geometry & Calculus I	.....	5
MH 162	Analytic Geometry & Calculus II	.....	5

MH 163	Analytic Geometry & Calculus III	.....	5
MH 266	Topics in Linear Algebra	.....	3
MH 331	Introduction to Modern Algebra I	.....	5
MH 541	Geometry, A Modern View I	.....	5
MH 567	Mathematical Statistics	.....	5
	Approved Mathematics Electives	.....	3
EE 202	IE 204 or demonstrate proficiency in programming digital computers	.....	0-3

Major: 45-54 Hours

MH 161	Analytic Geometry & Calculus I	.....	5
MH 162	Analytic Geometry & Calculus II	.....	5
MH 163	Analytic Geometry & Calculus III	.....	5
MH 264	Analytic Geometry & Calculus IV	.....	5
MH 331	Introduction to Modern Algebra I	.....	5
MH 541	Geometry, A Modern View	.....	5
MH 567	Mathematical Statistics	.....	5
EE 202	IE 204, MH 408 or demonstrate proficiency in programming digital computers	.....	0-5

Students majoring in mathematics must also complete either requirements 1 or 2, as follows:

1. MH 520 Analysis I	.....	5
MH 521 Analysis II	.....	5
MH 522 Analysis III or	.....	5
MH 332 Introduction to Modern Algebra	.....	5
2. MH 266 Topics in Linear Algebra	.....	3

Four additional mathematics courses to total at least 16 hours selected from the areas of algebra, geometry, and analysis with not all selections in the same area. 16

Composite Major: 64-71 Hours

MH 161	Analytic Geometry & Calculus I	.....	5
MH 162	Analytic Geometry & Calculus II	.....	5
MH 163	Analytic Geometry & Calculus III	.....	5
MH 264	Analytic Geometry & Calculus IV	.....	5
MH 265	Linear Differential Equations	.....	3
MH 266	Topics in Linear Algebra	.....	3
MH 331	Introduction to Modern Algebra I	.....	5
MH 332	Introduction to Modern Algebra II	.....	5
MH 541	Geometry, A Modern View I	.....	5
MH 567	Mathematical Statistics	.....	5
MH 301	History of Mathematics or	.....	5
MH 520	Analysis or	.....	5
	Geometry elective	.....	3-5

Students with a composite major must also complete either requirement 1 or 2

1. MH 560 Introduction to Numerical Analysis or	5
MH 561 Numerical Matrix Analysis	5
MH 518 Analysis for Applied Mathematics	5
IE 204 Computer Programming	3
IE 301 Information Retrieval	3
IE 585 Computer Programming Systems	3
Approved electives in computer programming	6
2. EE 202, IE 204, or MH 508 or demonstrate proficiency in programming digital computers	0-5
MH 520 Analysis I	5
MH 521 Analysis II	5
MH 522 Analysis III	5
Algebra elective	5

MIDDLE SCHOOL

The Middle School program prepares teachers for the junior high school grades. Students completing this curriculum are eligible for certification in two middle school-junior high school teaching fields.

MUSIC**Minor: 28 Hours**

MU 131, 132	10
	Material and Organization of Music	.....
MU 187, 188, 189, 287, 288, 289	.....	6
	Applied Music, preferably in one area, but if in two areas four hours must be in one area	.....

MU 352, 353	6
Music History II & III	
MU 361	3
Conducting I	
One of the following:	
EED 396 (if major interest is in Elementary School Music)	3
Music for the Elementary Teachers or SED 594 (if major interest in music is instrumental music)	3
Organization of Instrumental Music or SED 595 (if major interest is choral music)	3
Organization of Choral Music	

Major: 72 Hours

Minor Requirements in Music	28
Band, Choir, Orchestra, or Choral Union	11
MU 133, 231, 232, 233	20
MU 351 Music History	3
MU 387, 388, 389, 487, 488 Applied Music	5
MU 362 Conducting	1
SED 594 Organization of Instrumental Music or SED 595 Organization of Choral Music	3
Music elective	1

Composite: 89 Hours

Major Requirements	72
Completion of A or B below	17
A. Instrumental and Choral	
SED 594 or SED 595 (the one not completed in the music major)	3
MU 113, 114, 115, 116, 117, 118, or 119	5
MU 477 Music Arranging	3
MU 409 Marching Band Techniques	3
MU 454 Instrumental Music Literature	3

B. Choral and Elementary School Music

EED 396 Music for the Elementary Teacher	3
MU Electives	5
MU 478 Music Arranging	3
MU 452 Vocal Literature	3
MU 453 Choral Literature	3

SCIENCE**A. General Science****Major: 45 Hours**

CH 103-104 General Chemistry	10
BI 103 Biology	5
PS 205-206 General Physics	10
Approved Electives (5 hrs. must be from biological science)	20

B. Biological Science**Minor: 30 Hours**

BI 103 Biology	5
ZY 250 Human Anatomy	5
ZY 251 Physiology	5
BY 300 General Microbiol.	5
ZY 300 Genetics	5
Approved electives	5

Major: 45 Hours*

Minor Requirements	30
Approved electives	15

*Requires CH 103-104 or equivalent

C. General Physics**Minor: 30 Hours**

PS 205-206 Introductory Physics	10
PS 210 Principles of Modern Physics	5
PS 215 Astronomy	5
PS 517 Introduction to Biophysics	5
PS 570 Health Physics	5

D. Physics***Minor: 27 Hours**

PS 220 Gen. Physics I	4
PS 221 Gen. Physics II	4

PS 222 Gen. Physics III	4
PS 300 Intermediate Electricity and Magnetism	4
PS 302 Electronics	5
PS 305 Modern Physics	5
PS 412 Seminar	1

Major: 42 Hours**Minor Requirements** 27**Approved Electives to be selected from:**

PS 515 Intr. to Quantum Mech	
PS 521 Modern Electronics	
PS 303 Optics	
PS 535 Intr. to Solid State Physics	15

*Physics majors will complete minor in mathematics (including MH 501).

E. Chemistry**Minor: 30 Hours**

CH 103 General Chemistry*	5
CH 104 General Chemistry*	5
CH 105 General Chemistry	5
CH 207 Organic Chemistry	5
CH 208 Organic Chemistry	5
Approved elective	5

Major: 45 Hours**Minor Requirements** 30**Approved Electives** 15

*Prerequisites for CH 105. Credit in these courses applied to general education requirement in physical science.

SOCIAL SCIENCE

All students majoring in political science, sociology, economics, or geography, and not minoring in history, and all students minoring in political science, sociology, economics, geography or psychology and not majoring in history, must include in their social science general education requirements the following:

U.S. History 5 hours

GENERAL SOCIAL SCIENCES**Major: 45 Hours**

HY 202 United States History	5
EC 200 Economics I	5
PO 209 Introduction to American Government	5
GY 102 or 302 Prins. of Econ. Geography	5
Approved elective from 300-500 course in U.S. History	5
Approved electives from 300-500 courses in sociology, economics, political science and geography	20

1. Economics**Minor: 30 Hours**

EC 200 Economics I	5
EC 202 Economics II	5
EC 556 Intermediate Macro Economics	5
EC 552 Comparative Economics Systems	5
Approved 300-500 level economics courses	10

Major: 40 Hours**Minor Requirements** 30

EC 274 Business and Ec. Statistics I	5
Approved 300-500 level economics courses	5

2. Geography**Minor: 30 Hours**

GY 102 Principles of Geography	5
GY 302 Economic Geography	5
GY 405 Cultural Geography of the World	5
Approved 300-500 level GY	15

Major: 40 Hours**Minor Requirements** 30

Approved 300-500 level GY courses 10

3. Sociology Minor: 30 Hours

SY 202	Social Problems.....	5
ANT 203	Introduction to Anthropology.....	5
	Approved 300-500 level Sociology courses.....	20

Major: 40 Hours

	Minor Requirements.....	30
SY 304	Minority Groups.....	5
SY 308	Juvenile Delinquency.....	5

4. History Minor: 30 Hours

U.S. HY (5 hours above freshman level).....	10
Selections from Latin American area.....	5
Selections from non-western, non-American area.....	5
Approved 300-500 level history courses.....	10

Major: 40 Hours

	Minor Requirements.....	30
	Selected 300-500 level courses in area of student's choice providing depth study in one area.....	10

5. Political Science Minor: 30 Hours

PO 209	National Government.....	5
PO 210	State Government.....	5
PO 309	Intr. to International Relations or	
PO 312	An Intr. to Comparative Gov.....	5
	Approved 300-500 level PO Courses.....	15

Major: 40 Hours

	Minor Requirements.....	30
PO 522	Recent and Contemporary Political Theory.....	5
PO 340	Political Parties and Politics.....	
PO 323	Municipal Gov. in the U.S.....	
PO 405	Metropolitan Area Gov. Problems or	
PO 445	The Gov. and Politics of the Developing Nations.....	5

6. Psychology Minor: 30 Hours

PG 211	Psychology I.....	5
PG 212	Psychology II.....	3
PG 215	Quantitative Methods in Psychology.....	5
PG 330	Social Psychology.....	4
PG	Elective.....	13

7. Behavioral Science Composite: 67-70 Hours

Behavioral Science—Psychology		
PG 211	Psychology.....	5
PG 212	Psychology.....	3
PG 215	Quantitative Methods.....	5
PG 320	Experimental Psychology I: Learning.....	4
PG 321	Experimental Psychology II: Perception.....	4
PG 322	Experimental Psychology III: Personality.....	4
PG 330	Social Psychology.....	4
	Electives in Psychology.....	11
SY 304	Minority Groups or	
SY 520	Race and Ethnic Relations.....	5
SY 308	Juvenile Delinquency.....	5
	Electives in Sociology.....	5
ANT 203	Introduction to Anthropology.....	5
	Electives in Anthropology.....	10
Behavioral Science—Sociology		
SY 220	Statistics.....	5
SY 304	Minority Groups or SY 520 Race and Ethnic Relations.....	5

SY 308	Juvenile Delinquency.....	5
SY 309	Social Thought or SY 502 Social Theory.....	5
	Electives in Sociology.....	20
PG 211	Psychology.....	5
PG 212	Psychology.....	3
PG 330	Social Psychology.....	4
ANT 203	Introduction to Anthropology.....	5
	Electives in Anthropology.....	10

SPEECH

Minor: 34 hours

SC 200	Intr. to Undergraduate Study in Sp. Comm.....	5
SC 201	Speech Communication Theories.....	5
SC 220	Fundamentals of Oral Interpretation of Literature.....	5
SC 273	Group Problem Solving Through Discussion.....	5
SC 211	Public Speaking.....	5
SED 201P	Communication Problems.....	3
SED 201Q	and L Materials of Instruction.....	3
	Approved electives in Speech Communication.....	3

Major: 49 hours

	Minor Requirements.....	34
SC 278	Argumentation and Debate.....	5
	Approved electives in Speech Communication.....	10

Speech-English Composite: 84 hours

Composite Major—83 Hours

	Major requirements in Speech Communications.....	49
SED 575	Problems in Improvement of Reading at Secondary School Level.....	5
SED 502	Rhetoric and Composition for Teachers.....	5
SED 501	Language Study for Teachers.....	5
	Approved electives in English.....	20

Vocational and Adult Education

VED 414	Program in Area of Specialization.....	3
VED 415	Teaching in Area of Specialization.....	3
VED 510	Occupational Information or.....	3
VED 556	Learning Resources in Area of Specialization.....	4
*VED 346	Vocational and Adult Education****.....	3
*VED 462	Directed Work Experience in Dist. Ed*****.....	5
*VED 558	Coordination and Supervision of Vocational Education****.....	4
*VED 574	Organization Instruction in Vocational-Technical Ed*****.....	4

ADULT EDUCATION

Minor: 30 Hours

CED 521	Guidance in the Public Sch.....	5
VED 513	Nature of Adult Ed.....	5
VED 425	Prof. Intern. in Voc. and Adult Ed.....	5
VED 466	Tchg. Out-of-Sch. Groups.....	3
VED 569	Commun. Prog. in Adult Ed.....	5
VED 591	Prob. in Tchg. the Disadv. Adult.....	5
	Approved Elective.....	2

Composite 80 Hours

PG 507	Maturity and Aging.....	5
CED 521	Guidance in the Pub. Sch.....	5

*Home Economics majors take VED 411 and 412 instead.

**Optional in all areas.

****Business Education and Distributive Education only. Business Education majors may substitute VED 541.

*****Distributive Education only.

*****Distributive Education and Trade and Industrial Education only

VED 513	Nature of Adult Ed.	5
VED 566	Tchg. Out-of-Sch. Groups	3
VED 569	Commun. Prog. in Adult Ed.	5
VED 591	Prob. in Tchg. the Disadv. Adult or	5
EED 302	Curr. I Rdg. and Other Lang. Arts	5
SED 575	Prob. in Improv. of Rdg. at the	5
	Sec. Sch. Level	7
	Approved Electives	40
	Teaching Concentration	40

AGRICULTURAL EDUCATION**Major: 75 Hours**

AEC 301	Agricultural Marketing	5
AEC 501	Farm Management	5
VED 404	Practicum in General Metals	5
VED 406	Practicum in Building Construction	5
AY 307	General Soils	5
ADS 200	Intr. Animal and Dairy Science	5
HF 221	Landscape Gardening	5
ZY 502	Economic Entomology	5
	Approved Electives in Gen.	35
	Ag. or Tech. Ag.	35

BUSINESS EDUCATION***A. General Business****Major: 62 Hours**

VED 200	201, 202 Typewriting I, II, III	9
ACF 211	212, 311, 312 Accounting	18
MN 207	Elec. Data Pro. Principles	5
VED 305	Records Management	3
MN 310	Principles of Management	5
MT 331	Principles of Marketing	5
MN 241	Business Law	4
EH 415	Business Communication	3
VED 420	Office Machines	3
VED 424	Administrative Management	3
	Approved Electives	4

*Not more than 25 percent of the required hours for graduation may be taken in courses offered by the School of Business.

B. Secretarial Administration**Major: 64 Hours**

VED 200	201, 202 Typewriting I, II, III	9
VED 210	211, 212, 300 Shorthand I, II, III, Transcription I	20
ACF 211	212 Accounting	8
MN 207	Elec. Data Pro. & Computer Prog.	5
VED 305	Records Management	3
MN 310	Principles of Management	5
MN 241	Business Law	4
VED 420	Office Machines	3
VED 422	Secretarial Procedures I	5
	Approved Electives	2

C. Business Management**Composite Major: 70 Hours**

VED 200	201, 202 Typewriting I, II, III	9
ACF 211	212, 311, 312 Accounting	18
MN 207	Elec. Data Pro. & Computer Prog.	5
MN 305	Records Management	3
ACF 340	Personal Finance	3
MN 241	242 Business Law	8
EH 315	Business and Professional Writing	3
EC 360	Money and Banking	5
VED 420	Office Machines	3
MT 331	Principles of Marketing	5
MN 310	Prin. of Mgt.	5
VED 424	Admin. Mgt.	3

D. Management Services**Composite Major: 77 Hours**

VED 200	201, 202 Typewriting I, II, III	9
VED 210	211, 212, 300 Shorthand I, II, III, Transcription I	20

ACF 211	212 Accounting	8
MN 207	Elec. Data Pro. & Computer Prin.	5
VED 305	Records Management	3
MN 310	Principles of Management	5
ACF 340	Personal Finance	3
MN 241	Business Law	4
EC 350	Labor Economics	5
VED 420	Office Machines	3
VED 422	Secretarial Procedures I	5
MT 331	Principles of Marketing	5
	Approved Electives	2

*EC 200 and 202 to be taken in social science general education area. For the 5 hours of required mathematics MH 159 or 160 is recommended. MH 161 may profitably be used as an elective.

See Office Administration noncertification program on page 132.

DISTRIBUTIVE EDUCATION***Composite 57**

EC 202	Economics II	5
EC 274	Business & Economic Statistics I	5
EC 350	Labor Problems	5
ACF 340	Personal Finance	3
MT 331	Principles of Marketing	5
MT 432	Promotional Strategies, Pr. MT 331	5
MT 433	Retail Store Management	5
MT 434	Purchasing	5
MT 438	Marketing Channel Systems	5
MN 442	Personnel Management	5
	Electives in area of interest	9

*Not more than 25 percent of the required hours for graduation may be taken in courses offered by the School of Business.

HEALTH OCCUPATIONS EDUCATION**Major: 67 Hours**

VED 352	Nomenclature for Health Occup.	5
VED 354	Careers in Health	5
	Related Occup.	5
VED 356	Health Delivery Systems	5
VED 495	Practicum	12
	Hospital	3
	Non-Hospital	3
	Health Agency	3
	Animal Clinics	3
VED 513	Nature of Adult Education	3
VED 541	Development of Vocational Education	4
	Approved Electives	33

VOCATIONAL HOME ECONOMICS EDUCATION**Major: 68 Hours**

NF 104	Prin. of Food Prep.	5
CA 113	Housing for Man	3
CA 115	Clothing and Man	3
CA 105	Fund. of Clothing	5
CA 116	Art for Living	3
NF 112	Nutrition and Man	3
NF 204	Meal Mgt.	5
CA 206	Garment Structures	3
HF 225	Flower Arranging	3
FCD 267	Child Development 1: Prin. & Theory	4
FCD 268	Family 1: Structure & Funct. of Family	5
FCD 347	Lab. Exp. with Young Children	2
CA 233	Home Equipment	5
CA 303	The House	Select one 5
CA 313	Home Furnishings	3
CA 343	Interior Home Problems	3
CA 323	Man the Consumer	3
CA 431	Man-Environmental Relations	2
CA 443	Home Management Residence	5
	Approved Electives	9

Composite: 86-88 Hours

Major Requirements 68
Select 18-20 hours from A, B, C, D, or E. 18-20

A. Clothing and Textiles

CA 225	Textiles	5
CA 516	Apparel Quality Analysis	5
CA 555	Flat Pattern Designing	5
	Approved Electives	3-5

B. Family and Child Development

FCD 301	Child Development I Infancy & Pre School or	
FCD 302	Child Development III School Age &	
	Adolescence	4
FCD 305	Family II Mate Selection & Marital Interaction or	
FCD 306	Family III Patterns of Family Interaction	4
FCD 560	Management Problems in the Home	3
FCD 467	Parent Education	4
FCD 568	Woman's Changing Roles and	
	Potentialities	3

C. Home Management and Family Economics

FCD 541	Family Financial Management	5
FCD 560	Management Problems in the Home	3
CA 490	Social Problems of Housing	5
	Approved Electives	5

D. Home Management, Housing and Equipment

CA 233	Home Equipment	5
CA 303	The House	5
CA 313	Home Furnishings	5
CA 343	Interior Home Problems	5
CA 333	Lighting Design	3-5
CA 533	Food Equipment	5
FCD 541	Family Financial Management	
FCD 560	Management Problems in the Home	3-5
CA 553	The Consumer and the Market	3

E. Nutrition and Foods

NF 362	Problems in Community Nutrition or	
NF 452	Family Nutrition	3
NF 578	Modern Views of Nutrition	3
NF 588	International Nutrition	3
NF 324	Food Preservation	3
CA 533	Food Equipment	3
	Approved Electives	9-10

INDUSTRIAL ARTS EDUCATION**Minor: 28 Hours**

CA 345	Creative Crafts	3
TS 102	Graphical Communication and Design	2
TS 111	Woodworking	1
TS 112	Welding Science	1
TS 113	Machine Tool Laboratory	1
TS 114	Sheet Metal Design	1
TS 115	Foundry Technology	1
TS 307	General Metals or	
VED 404	Practicum in General Metals	5
TS 402	Advanced Wood or	
VED 406	Practicum in Building Construction and	
	Maintenance	5
VED 246	Instructional Drawing	3
VED 403	Principles of Electricity	1
VED 407	Practicum in Electricity	4

Major: 50 Hours

Minor Requirements	28
TS 216 Plastics Technology	2
VED 409 Practicum in Electronics	4
VED 457 Graphic Arts	3
Elective in Metal Area	5
Elective in Power Area	5
Elective in Drawing Area	2

Composite: 70 Hours**Common Courses for A, B, and C Options**

TS 102	Graphical Communication and Design	2
TS 105	Engineering Drawing II or	
TS 108	Design for Management	2
TS 111	Woodworking	1
TS 112	Welding Science and Application	1
TS 113	Machine Tool Laboratory	1
TS 114	Sheet Metal Design and Fabrications	1

TS 115	Foundry Technology	1
TS 216	Plastics Technology	2
TS 307	General Metals or	
VED 404	Practicum in General Metals	5
TS 308	Gages and Measurements	5
TS 402	Advanced Woodworking or	
VED 406	Practicum in Building Construction and	
	Maintenance	5
VED 246	Instructional Drawing	3
VED 403	Principles of Electricity	1
VED 405B	The School Shop	3
VED 407	Practicum in Electricity	4
VED 409	Teaching Electronics in Industrial Arts	4
VED 457	Practicum in Graphic Arts	3
	Approved Elective	4
Select 26 hours from A, B, or C below.		

A. Basic Power Mechanics

CA 345	Creative Crafts	2
MN 310	Principles of Management or	
PG 561	Industrial Psychology	5
VED 400	Introduction to Power Mechanics	5
VED 401	Practicum in Small Gasoline Engines	5
VED 402	Advanced Auto Repair	5
	Approved Elective	4

B. BASIC METAL TECHNOLOGY

CA 345	Creative Crafts	1
MN 310	Principles of Management or	
PG 561	Industrial Psychology	5
TS 405	Problems in Welding Engineering	5
TS 406	Problems in Machining	5
VED 400	Introduction to Power Mechanics	5
VED 401	Practicum in Small Gasoline Engines or	
VED 402	Advanced Auto Repair	5

C. BASIC DRAFTING & DESIGN

BT 101	Introduction to Building	3
BT 102	Drawing and Projections	3
CA 345	Creative Crafts	2
MN 310	Principles of Management or	
PG 561	Industrial Psychology or	
BT 206	Materials and Construction	5
TS 104	Descriptive Geometry	2
TS 107	Graphical Analysis & Design	2
VED 400	Introduction to Power Mechanics or	
VED 401	Practicum in Small Gasoline Engines	5
TS 307	General Metals	5
	Approved Electives	7

TRADE AND INDUSTRIAL EDUCATION**Major: 60 Hours**

VED 475-	480 Trade and Industrial Exp.	30
EH 315	Business and Professional Writing	3
MN 310	Business Organization and	
	Management	5
EC 350	Labor Economics	5
MT 331	Principles of Marketing	5
VED 558	Coord. and Supervision of VED	4
VED 246	Instructional Drawing	3
	Approved electives	5

†Credit for VED 475-480 (inc.) (5-5-5-5-5) by supervised employment or by examination on a basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to journeyman level. If employment experience required for certification is obtained prior to starting the curriculum, elective coursework may be substituted for these credits. Time required to complete curriculum would be reduced accordingly.

OFFICE ADMINISTRATION

The Office Administration Program is a noncertification program designed to prepare students to become professional secretaries, administrative assistants or for other responsible positions in business, government, or professional offices. This program does not require admission to Teacher Education.

Emotional Disturbance		90
English	30	
Composite		86-88
Foreign Languages	33	51
Foreign Language-English Composite		81
Health Education	31	52
Health Occupations Education		67
Health and Physical Education		56
Health, Physical Education and Recreation		
Composite		77
Home Economics		68
Composite		86-88
Industrial Arts	28	50
Composite		70
Basic Power Mech.		
Basic Metal Technology		
Basic Drafting and Design		
Mathematics	31	45-54
Composite		64-71
Mental Retardation		93
Middle School		70
Music	28	72
Composite		89
Instrumental and Choral		
Choral and Elementary School Music		
*Office Administration	30	66
*Recreation Admin.	30	
Composite		98-100
*Rehab. Services Ed.		56
Science		
Gen. Science		45
Biol. Science	30	45
Gen. Physics	30	
Physics	27	42
Chemistry	30	45
Social Science		
Gen. Soc. Science		45
Economics	30	40
Geography	30	40
Sociology	30	40
History	30	40
Polit. Science	30	40
Psychology	30	
Behavioral Science Composite		70
Behavioral Science—Psychology		67
Behavioral Science—Sociology		49
Speech Communication	34	84
Speech-English Composite		
Speech Pathology		98
Composite		60
Trade and Industrial Education		
*Non-certification programs.		

Field Experiences

The Laboratory Experiences Program provides sequential learning opportunities in public school and community settings for all students throughout the teacher preparation program. Laboratory experiences are provided primarily through the following programs: (1) **Field Experience Program**, (2) **Extended Laboratory Experiences** including a para-professional level program for secondary majors, (3) **Cooperative Education Program**, and (4) the **Professional Internship**.

The pre-teaching **Field Experience Program** provides an initial base-line experience for all students as a prerequisite for admission to the Professional Teacher Education Program. Students are required to participate in the program for a minimum of three days, in conjunction with Career Exploration and Planning (IED 101), or in Orientation for Transfer Students. This experience involves the students in planning and evaluating learning experiences, counselling, participating in pre-school conferences and faculty study, school and community meetings, and involvement in actual teaching situations.

The Extended Laboratory Experiences Program is conducted concurrently with enrollment in professional education courses which provide experiences in the schools and communities.

The Co-operative Education Program provides laboratory experiences for certain students involved in the teacher preparation program on an alternating quarter arrangement with college attendance. (For description see page 53).

The Professional Internship is a full-time assignment in an off-campus school and community. Experiences include personal and professional contacts with various phases of community life and the application of concepts, skills and knowledge the student has acquired in classroom situations.

The student enrolls for 15 credit hours and devotes a full quarter to the internship. No additional coursework, correspondence or regular, is permitted during the internship quarter. The program is divided into orientation, off-campus experience, and evaluation. Students must be admitted to the Teacher Education Program prior to the Professional Internship and must have completed appropriate courses in their areas of specialization.

The Internship for students with a major or minor in art, theatre, health, physical education and recreation, industrial arts, music, speech communication, and speech pathology, requires experience in both elementary and secondary schools.

Students who have had teaching or other related experiences may satisfy the Internship through a special program which is offered for 10 quarter hours credit during the Summer Quarter. Students will be considered on an individual basis for the special program.

The following special credit options which emphasize laboratory experiences in undergraduate study are available in all undergraduate programs of the School of Education:

(See full description under departmental in Course Descriptions.)

425. Professional Internship in Elementary School (15). Pr., senior standing, admission to teacher education prior to internship, appropriate professional courses.

446. Directed Independent Study (1-10).

450. Special Topics (1-5).

495. Practicum (1-10).

Other laboratory experiences for students are provided within the framework of courses in the Teacher Education Program.

Dual Objectives Program

Students in other schools of the University who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program.

A student electing to pursue the dual objectives program will have an adviser in the academic department in which he is enrolled and an adviser in the School of Education. Advising the student concerning the curriculum of the academic department, including the major, minor and other requirements, will be the responsibility of the adviser in that department. The responsibility

for advising the student on matters concerning the Teacher Education Program, which includes General Education, areas of teaching specialization, and Professional Education, will be that of the adviser in the School of Education. The quarterly course schedule of the student will be approved by both advisers. Information describing the dual objectives program is available in the Student Personnel Office of the School of Education in Haley Center and in the Office of the Dean of the School in which the student is enrolled.

Students enrolled in the School of Education who desire to complete certification requirements in more than one teaching field will complete the curriculum in each field: general studies, teaching specialization and professional teacher education (including the internship).

Applications and specific information about the criteria for selection and admission to Teacher Education are available in the Student Personnel Office in Haley Center, 3464.

Graduate Programs

Graduate programs are offered through the Graduate School in administration and supervision; counselor education; educational media; elementary education; health education; physical education; rehabilitation services; secondary education; special education; and vocational and adult education.

Fifth and sixth-year programs of study in the above areas lead to the degrees of Master of Science, Master of Education, and Specialist in Education. Nondegree graduate study is also available through the Diploma Program leading to sixth-year certification.

The Doctor of Education is offered in Educational Leadership, Counselor Education, Elementary Education, Secondary Education, and Vocational and Adult Education. Specializations in Secondary Education include the following sub-specializations: (a) English Education, (b) Mathematics Education, (c) Science Education, and (d) Social Science Education. See *Graduate School Bulletin*.

The Master of Education, Master of Science in Education, Specialist in Education and Doctor of Education are offered for junior college administrators, student personnel administrators, and teachers. These programs meet requirements of the Southern Association of Colleges and Schools, the Graduate School, and the School of Education. Sufficient flexibility exists to permit students to adapt programs to their individual needs. Course guides for each of the various programs are available in the Office of the Dean of Education.

Related Programs and Services

Teacher Certification Services

Programs in the School of Education are approved by the National Council for Accreditation of Teacher Education (NCATE), the National Association of State Directors of Teacher Education and Certification (NASDTEC), the Interstate Reciprocity Compact (IRC) and the Alabama State Board of Education for certifying superintendents, supervisors, principals, counselors,

elementary and secondary teachers, and educational media specialists. Upon satisfactory completion of a prescribed course of study and upon recommendation of the Dean of the School of Education a professional certificate will be issued by the appropriate State Department of Education. Twenty-eight State Departments of Education now have reciprocal agreements for issuing certificates to graduates of institutions accredited by NCATE.

Students in schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program. (See page 134.) Students may also take courses in education and psychology for acquiring knowledge and understanding of human growth and development, and teaching as a profession. They are eligible to take all such courses for which they satisfy prerequisites.

Student Personnel Services

This program assists the student in understanding the University and becoming a part of it, in identifying his strengths and limitations, in determining his professional goals, in selecting the proper curriculum in the University, and in securing employment upon graduation.

Recruitment—Efforts of organizations such as the Future Teachers of America in the secondary schools and the Student National Education Association in colleges and of individuals and groups in the profession are aimed at seeking out, informing, and encouraging students, to consider teaching as a profession.

Orientation—The Career Exploration and Planning Program provides University personnel with an understanding of the student's background, individuality, and needs. It assists the student in obtaining information about the University and its programs, in learning more about himself, and in selecting professional goals that are compatible with his abilities. All freshmen in the School of Education and in the dual objectives program participate in this program during their freshman year. Similar attention is provided for transfer students through an orientation and program planning sequence provided by each department.

Counseling—Each Education student is assigned to a faculty adviser who assists the student whenever possible. Other sources of assistance include personnel in the Office of the Dean, classroom teachers, personnel in the Student Development Center, the offices of the Dean of Women, the Dean of Student Affairs, the Registrar, dormitory head residents and counselors, and ministers of local churches. Peer assistance is available through the Student National Education Association (SNEA) located in Haley Center 2002.

The Selective Admission and Retention Program in Teacher Education—In recognition of responsibilities to the schools in which its graduates teach, the School maintains a program of selective admission and retention of candidates for the teaching profession. This program is designed to assure that no candidate is recommended for admission to the Teacher Education Program, the professional internship or certification unless he is deemed competent in his University studies and professional performance.

The student must submit a formal written application for admission to Teacher Education after completing at least 90 quarter hours (60 semester hours) of work, usually at the end of the sophomore year. Transfer students must submit the application after completing at least 12 quarter hours (nine semester hours) at Auburn University. Criteria for admission are*:

- (1) a minimum grade point average of at least 2.2 (on a four point scale) on all college work attempted during the previous 90 quarter hours. Transfer students must achieve this minimum grade point average on at least 12 quarter hours completed at Auburn University;
- (2) satisfactory performance on a written and spoken English language competency examination;
- (3) satisfactory performance in an interview examining personality, interests, and aptitudes consistent with the requirements for successful teaching;
- (4) a score of at least 16 on the ACT test, which cannot be more than five years old; and
- (5) successful performance in the pre-professional field experience.

A student who fails to meet these criteria upon initial application may submit new evidence in an effort to satisfy any and/or all of the above standards.

Any exception to these criteria must be approved by the Dean of the School of Education.

While retention in the Teacher Education Program is based on the continuous evaluation of the student, a formal evaluation takes place as a prerequisite for admission to the professional internship. Requirements for admission to the professional internship are*:

- (1) admission to the Teacher Education Program;
- (2) completion of appropriate courses in the area of specialization;
- (3) a grade point average of 2.2 or above on all courses attempted in each of the following: professional teacher education, the teaching major, and the teaching minor; and
- (4) demonstrated potential for teaching.

In addition, in order to be eligible for graduation with teacher certification, the student will be expected to complete the requirements identified above, to demonstrate readiness to teach through on-the-job performance, and to achieve a satisfactory score on a comprehensive examination.

Persons with degrees other than in education may make application for study in a curriculum leading to professional certification, but they will be required to complete the above standards in order to qualify for state certification.

Applications and specific information about the criteria of selection for admission to teacher education are available from the Student Personnel Office in Haley Center 3464.

Placement and Follow-up—The Teacher Placement Service provides assistance to prospective teachers in locating desirable positions and assistance to employers in identifying candidates. Persons interested in placement

*Required of entering students as of June 1, 1977.

should contact the Student Personnel Office, Haley Center 3464. Follow-up studies of successes, failures, and problems of graduates are made. Further information may be obtained from the Coordinator of Student Personnel Services in Haley Center.

Extended Education and Human Development Services

These services constitute the phase of the work of the School of Education which is designed to make the programs and services of the School available to individuals and off-campus groups for continuous improvement of public education in the State and region. Major categories of services available:

Off-Campus Instruction—This instruction is available through the Field Laboratory Program, enabling teachers in service to complete residence credit toward a graduate degree. The program uses the local school setting as a laboratory in which graduate courses are provided as a framework for solving instructional problems related to various areas of study. The program may be used as a supplement to existing in-service programs or as a basis for developing such programs.

Short courses may also be offered on a non-credit basis for groups interested in specific areas of education and psychology. The courses may consist of a series of lectures or workshops and are available to groups of professional and non-professional personnel interested in short courses in some specific aspect of their work.

Educational Television—Resources and materials of the School of Education are presented to Alabama citizens through the facilities of the Alabama Education Television Network. Telecasts direct and enrich teaching programs for elementary and secondary school students, and assist teachers in their professional career development programs.

Lecture and Consultative Service—The staff of the School of Education is composed of persons who are skilled in general and specific areas of education. The Office of Extended Education and Human Development Services coordinates the services of these faculty members for lecture and consultative services. These services may be used with in-service education, school and community projects, teacher workshops and institutes, and community clubs and organizations.

School Surveys—School systems desiring comprehensive school surveys or surveys in specific areas of education such as school plant utilization and construction, school finance, administrative organization, and curriculum and teaching programs, may secure services of this type from the School of Education. Surveys may be conducted as separate projects or in conjunction with the Field Laboratory Program described above.

Research Services—School systems may wish to conduct research in such areas as the instructional program, administrative and supervisory patterns and organizations, school and community projects, the development and evaluation of testing programs, and the use of instructional materials and facilities. The assistance of the staff of the School of Education is available for these activities, either as separate endeavors or in conjunction with the instructional and survey services described above.

Correspondence Study—Correspondence study provides undergraduate instruction for persons unable to attend college on a regular basis.

Courses parallel to those given on campus are available in English, education, economics, health, physical education and recreation, history, psychology, and sociology. Other courses may be added as the demand warrants. All the courses carry college credit. For information concerning the Correspondence Study Program of Auburn University, see page 53 of this Catalog.

Learning Resources Center

The Learning Resources Center (LRC) located in Haley Center is a service component for the School of Education and the School of Arts and Sciences. The LRC provides media services which include filmstrips, transparencies, disc recordings, tape recordings, kits, educational games, and programs of instruction. LRC personnel assist the faculty and students with the production, selection, and utilization of learning materials.

In-Service Agricultural Education and Supervision

J. C. HOLLIS, *State Supervisor*

ASSISTANT SUPERVISORS HOLLEY, HALCOMB, KILLOUGH, LEWIS, AND WHITE

In cooperation with the State Department of Education, the School of Education maintains an in-service teacher education and supervisory division. This service extends to 400 departments of vocational agriculture in accredited high schools of the State.

Vocational Rehabilitation Service

J. K. ROBERTS, *Supervisor*

CANTRELL, CAUGHRAN, AND LAMBERT, *Counselors*

The State Department of Education in cooperation with Auburn University maintains the local Rehabilitation Service which provides vocational guidance, counseling, training, and placement services to handicapped citizens. The Rehabilitation Service also makes available to handicapped citizens such services as: surgical and/or medical care, hospitalization, therapeutic treatment, and artificial appliances, when these services are essential to training and/or employment and the individual is not financially able to secure them.



School of Engineering

J. GRADY COX, *Acting Dean*
EDWARD O. JONES, *Associate Dean*
FRED J. MOLZ, *Assistant Dean*

ENGINEERING is a unique program which, in effect, has attempted to provide in a four-year period both a broad general education and a specialized technical education. Although centered around mathematics and the physical sciences, it recognizes the importance of the social sciences, the humanities, and the communication skills. And while the emphasis is upon problem-solving, engineering provides students with the opportunity to integrate their knowledge and to apply it specifically to the problems confronting society—problems such as energy, air and water pollution and urban planning.

Society's needs in the decades ahead will call for engineering talent on a scale never before seen. As a consequence, the opportunities for engineers will be unlimited. All too often, an engineering education is viewed as too specialized, while in actuality, the opposite is true. The basic education that engineering affords cannot be overlooked. The following engineering programs enable individuals to develop their natural talents and to provide knowledge, skills and understanding that will encourage them to find their place in society.

Programs

New P **Pre-Engineering**—The first year (of an integrated four-year program) of course work is administered as Pre-Engineering. This program is designated *(PTN)* Pre-Engineering Management (PNM) for students entering the management curricula, Pre-Chemical Engineering (PCN) for students entering the Chemical Engineering curriculum, and Pre-Engineering (PN) for all other curricula. *aviation*

Engineering—Curricula offered are designed to meet the educational requirements of the engineering professions. The program in the fundamental sciences of mathematics, chemistry, and physics is followed by a study of basic engineering sciences. Specialized or departmental courses are taken in the third and fourth years with Humanistic-Social Studies interspersed throughout the four years. Flexibility is provided in all degree programs through electives so that the individual student may emphasize areas of personal interest.

Curricula accredited by the national accrediting agency, the Engineers' Council for Professional Development, lead to the degrees of Bachelor of Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Materials Engineering, Mechanical Engineering and Bachelor of Science in Agricultural Engineering.

The Textile Engineering Department administers curricula leading to the degrees of Bachelor of Textile Engineering and Textile Chemistry, which are not accredited by the Engineers' Council for Professional Development.

Management—Two management curricula lead to the degrees of Bachelor of Aviation Management (administered by the Aerospace Engineering Department) and Bachelor of Textile Management (administered by the Textile Engineering Department). These curricula are interdisciplinary in nature and, building upon a broad foundation in mathematics, science, and the humanities, provide selected courses in engineering and business administration to produce graduates trained in technical management.

Dual Degree—The School of Engineering has joined with a number of other universities in offering a three-two program which results in two college degrees. Agreements have been completed with several other predominantly liberal arts institutions. The broad background provided by this program enables the student to cope more effectively with many of the problems of modern-day society.

The first three years would be devoted to earning a major in any one of the disciplines offered by that college while completing the basic sciences and mathematics required for pre-engineering. Upon completion of three years at the "first college" the student transfers to the School of Engineering and, after approximately 2 years study in an engineering curriculum, receives a baccalaureate degree from the "first college" and an Engineering baccalaureate degree from Auburn.

Dual degree agreements have also been completed between the School of Engineering and the Auburn University Schools of Agriculture, Arts and Sciences, and Business.

For additional information concerning the Dual Degree Program, contact the Dean of Engineering.

Graduate—Master of Science degrees are offered in Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. Three professional degrees, Master of Electrical Engineering, Master of Industrial Engineering, and Master of Mechanical Engineering, are offered. The Doctor of Philosophy degree is offered in Aerospace Engineering, Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. For requirements for these degrees, see the *Graduate School Bulletin*.

✓ Admission

Freshmen eligibility is determined by the Admissions Office. However, since the requirements for engineering education necessitate high school preparatory work of high intellectual quality and of considerable breadth, the following program is recommended as *minimum* preparation: English, four units; mathematics (including algebra, geometry, trigonometry, and analytical geometry), three to four units; chemistry, one unit; history, literature, social science, two or three units. Physics and foreign languages are recommended but not required.

Pre-Engineering Students are transferred to the curriculum of their choice in the School of Engineering after satisfactorily completing all the course requirements in the appropriate freshman program and also the requirements of the departmental Admissions Committee. *A student who has not proceeded from Pre-Engineering to his field of major interest in the School of Engineering after the completion of six quarters may continue to*

consideration will not be extended to anyone with an overall grade point average of less than 2.5.
The following requirements must be met:
register in Pre-Engineering only by special permission of the Dean of Engineering. Furthermore, Junior standing cannot be granted to any student in the Pre-Engineering Program regardless of the number of hours completed.

Transfers from Other Institutions must apply through the Admissions Office for admission to curricula in the School of Engineering. However, the exact placement of these students can be determined only upon review of their transcripts by the Director of Professional Programs of the School of Engineering. Students will then be placed in the curriculum of their choice if they have completed the requirements given in the preceding paragraph. Otherwise, assignment will be to the appropriate Pre-Engineering curriculum.

Students transferring from junior colleges are allowed credit for equivalent courses taken at the junior colleges, subject to a maximum equal to the number of hours printed in the first two years of their curriculum. The acceptable courses are not, however, limited to the listings within the first two years.

Many courses required by the School of Engineering are highly specialized in their content and potential transfer students need to select courses with care. Therefore, to insure maximum transferability of credits, students are encouraged to contact the School as soon as possible about acceptable credits. Write to the Director of Professional Programs, School of Engineering.

Transfer from on Campus **Humanistic-Social Electives**

Engineers must be more than specialists if they are to function effectively in the profession for the benefit of society. They must also be acquainted with the humanities, be aware of the social implications of their activities, and be equipped to assume responsibilities in these areas. To assist them in this preparation, degree requirements include approximately 20 quarter-credit hours of humanistic-social studies in addition to the specified courses in English Composition and History. *The University requires at least one course from the area of Humanities and one course from the area of Social Sciences. The courses are either prescribed, elective, or a combination, depending upon the specific engineering curriculum.* Lists of approved electives are available in the offices of the Directors of Pre-Professional and Professional Programs and the Department Heads. Other electives may be approved by the student's Department Head. General areas of acceptable courses follow:

Humanities: Appreciation of the Arts, History, Foreign Language (sophomore level and above), Literature, Philosophy and Religion.

Social Sciences: Anthropology, Economics, Political Science, Psychology and Sociology.

Additional Information

Military Training—All curricula in the School of Engineering permit the use of some basic and advanced ROTC. For these options, see the specific curriculum.

Service Department—The Technical Services Department offers courses in graphical methods, industrial laboratories, manufacturing processes, etc. The courses offered in this department may also be taken by students in other schools who may find them useful in their particular fields. The Department, in

cooperation with the School of Education, offers a program for the professional and technical training of Industrial Arts and Vocational teachers for elementary and secondary schools. (See School of Education for major and minor requirements.)

Cooperative Education—The Cooperative Education Program is offered in all curricula of the School of Engineering. Refer to page 53 for a brief description of the program and write to the Director, Cooperative Education, Auburn University, Auburn, Alabama 36830, for a booklet which gives additional information.

Extension—The Engineering Extension Service helps to extend the resources of the School of Engineering to the people, businesses, and industries of the state. Most of the programs of this expanding service are short courses, conferences, clinics, and seminars. For further information, write to the Associate Director, Engineering Extension Service, 107 Ramsay Hall.

Pre-Engineering

The Pre-Engineering Program consists of a freshman program of studies to prepare students for curricula in the School of Engineering. It also provides academic and career counseling to assist students in determining the curriculum that best fulfills their personal and educational objectives.

The Pre-Engineering curriculum shown below is uniform for Aerospace, Civil, Electrical, Industrial, Materials, and Mechanical Engineering. Therefore, a student is not required to designate a curriculum choice prior to the completion of the Pre-Engineering curriculum.

The curricula of Aviation Management, Chemical Engineering, Textile Chemistry, Textile Engineering, and Textile Management have separate freshman year requirements.

Schedule Requirements Pre-Engineering Curriculum

FRESHMAN YEAR					
First Quarter		Second Quarter		Third Quarter	
MH 161	An. Geom. & Cal.....5	MH 162	An. Geom. & Cal.....5	MH 163	An. Geom. & Cal.....5
CH 103	Fund. Chem. I.....4	CH 104	Fund. Chem. II.....4	PS 220	Gen. Physics I.....4
CH 103L	Gen. Chem. Lab.....1	CH 104L	Gen. Chem. Lab.....1	EH 103	English Comp.....3
EH 101	English Comp.....3	EH 102	English Comp.....3	THY	History.....3
THY	History.....3	THY	History.....3	TS 102	Graphic Comm.....2
	Free Elective.....1		Free Elective.....1		Physical Education.....1
	Physical Education.....1		Physical Education.....1		

*Students whose combined ACT scores of English and Mathematics are lower than 50, or whose total SAT scores are less than 1100 are enrolled in Mathematics 160 for no credit.

**Students whose composite ACT scores are lower than 25, or whose total SAT scores are less than 1130 are enrolled in Chemistry 101 followed by Chemistry 102 and Chemistry 103 Laboratory, followed by Chemistry 104 with Chemistry 104 Laboratory.

†Selected from the sequence of either HY 204-205-206 or HY 101-102-103.

Note: Basic ROTC may be selected by freshman students. The schedule should be worked out with the Director of Pre-Professional Programs. For acceptable credit, see individual curricula.

Department of Aerospace Engineering

The Aerospace Engineering curriculum provides a background for students entering many areas of today's scientific and technological fields. The first two years of study are devoted to the basic subjects of mathematics, physics, and mechanics. The last two years deal with such areas as aerodynamics, design, astrodynamics, propulsion, structures, and flight dynamics. In support of

these areas, courses in advanced mathematics, computer programming (both digital and analog), and systems analysis are offered. The methods of systematic problem analysis are stressed. The theory learned in classroom lectures is experimentally verified in laboratory sessions. During the senior year students may take technical electives in several fields of specialization. The Aerospace Engineering Curriculum also serves as a background for graduate study and research.

Curriculum in Aerospace Engineering (AE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	ME 321	Dynamics I	4	ME 301	Thermo. I	4
ME 205	Applied Mech. Statics	4	PS 222	General Physics III	4	AE 300	Aero. An. I	3
PS 221	Gen. Physics II	4	MH 265	Diff. Equat.	3	EE 261	Linear Circuit Analysis I	3
AE 203	Aerospace Fund.	3		Basic ROTC or Elect.	1	ME 207	Strength of Mat. I	3
	Basic ROTC or Elect.	1		Hum-Soc. Elect.	5		Hum-Soc. Elect.	3
							Basic ROTC or Elect.	1

JUNIOR YEAR

AE 307	Aero. Struct. I	5	AE 302	Airloads	4	AE 409	Aero. Struct. II	5
AE 310	Aero. An. II	4	AE 303	Theor. Aero. I	4	AE 515	Jet Propulsion	5
AE 330	Aero. Instr.	3	AE 326	Fund. of Aerospace Dynamics	3	AE 304	Theor. Aero. II	4
ME 340	Fluid Mech. I	3	AE 311	Aero. Mat. & Methods of Construct.	2	PS 320	Modern Physics	3
	Hum-Soc. Elect.	3	EH 304	Tech. Writing	3			

SENIOR YEAR

AE 439	Static Stab. & Control	4	AE 500	Viscous Aero	4	AE 529	Aircraft Vibration and Flutter	4
AE 534	Aero. Sys. Anal.	3	AE 532	Astrodynamics I	3	AE 533	Astrodynam. II	3
AE 305	Flight Perform.	3	AE 541	Dyn. Stab. & Cont.	3	AE 449	Aero. Design II	1
AE 401	Aero. Prob. I	1	AE 448	Aero. Design I	1	AE 402	Aero. Prob. II	1
	Tech. Elective†	3		Tech. Elective	6		Technical Elective	6
	Hum-Soc. Elect.	3					Hum-Soc. Elect.	3

TOTAL—208 QUARTER HOURS

See section on Humanistic-Social Electives.

†Advanced ROTC may be substituted for EH 304 and 3 hours of Technical Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

AE 427	Engineering Meteorology	3	EE 264	Linear Circuit Analysis II Laboratory	1
AE 491	Special Problems	1-5	EE 371	Electronics	3
AE 501	Adv. Three-dimensional Aerodynamics	3-5	IE 410	Probability & Statistics	5
AE 514	Equilibrium Gas Dynamics	3	ME 303	Thermodynamics III	3
AE 516	Rocket Propulsion I	3	ME 501	Statistical Thermodynamics	3
AE 517	Rocket Propulsion II	3	ME 521	Heat Transfer	4
AE 520	Dynamic Simulation	3	ME 522	Transport Phenomena	3
AE 521	Flight Vehicle Stress Analysis	3	ME 543	Photoelastic Stress and Strain Analysis	3
AE 524	Nonequilibrium Gas Dynamics	3	MH 503	Engineering Mathematics II	5
AE 528	Space Propulsion Systems	5	MH 506	Elementary Partial Diff. Equations	5
AE 535	Elements of VISTOL Flight	3	MH 560	Introduction to Numerical Analysis	5
AE 536	Rotary Wing Aerodynamics	3	MH 561	Numerical Matrix Analysis	5
AE 542	Automatic Stability and Control	3	PS 505	Nuclear Physics	5
AE 545	Missile Aerodynamics	3			
CHE 540	Nuclear Engineering	5			
EE 263	Linear Circuit Analysis II	4			

Aviation Management

The curriculum in Aviation Management provides education for management careers with the airlines, general aviation, manufacturing, governmental agencies or the military services. The study of fundamental aerospace courses is combined with specified subjects in industrial engineering, business management and selected electives to provide preparation for the various

specific functions of the aerospace industries including general management, production, operations, flying, maintenance, and education and training. Laboratory experience in aviation management and flight is provided through the university owned and operated airport in which students are given the opportunity to participate in administration, training and aircraft maintenance and servicing. The Aviation Management curriculum also provides a broad educational background of fundamental philosophies, theories, and concepts needed for research and study at the graduate levels.

Curriculum in Aviation Management (AM)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal. W. Trig.	5	MH 161	An. Geom. & Cal.	5	AM 200	Aerospace Problems Analysis	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY	History	3	HY	History	3	HY	History	3
TS 100	Intr. to Mfg. Proc.	2	TS 107	Graphical Anal. and Design	2	TS 108	Design for Mgt.	2
TS 102	Graph. Comm. & Design	2		Basic Shop Elective	1	PE	Physical Education	1
PE	Physical Education	1	PE	Physical Education	1		General Elective	3

SOPHOMORE YEAR

AM 201	Elem. Aeronaut.	5	EC 274	Bus. & Econ. Statistics	5	ACF 215	Fund. Gen. & Cost Accounting	5
EC 200	Economics I	5	PG 211	Psychology I	5	PO 209	Intr. to Am. Gov't.	5
PS 205	Intr. Physics	5	PS 206	Intr. Physics	5	AE 203	Aerospace Fund. or Computer Program	3
IE 201	Indus. Admin.	3	AM 202	Aerospace History	3	IE 204	Computer Program	3
						AM 309	Reciprocating Engr. & Prop. Principles	3
							General Elective	3

JUNIOR YEAR

SC 211	Public Speaking	5	AM 312	Guidance & Control Fund.	5	AM 305	Aviation Meteorology	5
MT 241	Business Law	4	IE 320	Engr. Economy	5	AM 313	Aerospace Veh. Sys.	5
AM 314	Aero. Mgt. and Oper. Problems (3) or Electronic Data Processing Sys.	4	IE 310	Motion & Time Study	5	MT 372	Econ. Transport	5
IE 316	Electronic Data Processing Sys.	4	EH 304	Tech. Writing	3	IE 302	Prod. Control Tech	3
AM 310	Jet Propulsion	3						

SENIOR YEAR

AM 407	Air Transport	5	MN 442	Personnel Mgt.	5	AM 417	Airline Oper.	5
MN 346	Org. Behavior	5	AM 409	Aerospace Legislation	3	AM	Elective	3
AM 403	Gen. Avn. Mgt.	3	AM 413	Airport Mgt.	3	AM 401	Aeronautical Sem.	1
	Technical Electives	6	AM	Elective	3		Technical Electives	6
				Technical Elective	4			

TOTAL—207 QUARTER HOURS

Twelve hours of ROTC (Basic 6; Advanced, 6) may be substituted for 6 hours of General Electives, SC 211 (five hours) and 1 hour of technical electives.

Basic Shop electives may include TS 112, 113, 114, 115, or 216. If TS 216 is used, the additional hour may be used as a Technical Elective.

*If AM 314 is scheduled, one additional hour of Technical Elective must be taken.

†Selected from the sequences of either HY 204-205-206 or HY 101-102-103.

Option in Professional Flight

This option develops competency in flight to prepare the student for a professional career in flight operations, to include such positions as a flight officer with the airlines, a corporate pilot or a flight instructor. Aviation Management students may qualify for this option by registering with the Aviation Management Program Coordinator and by completing as a minimum the following courses:

AM 215	Principles of Private Flight—Ground	3
AM 216	Completion of Private Flight—Ground	3
AM 217	Introduction to Flight Training	1
AM 218	Private Pilot Flight Training*	1
AM 321	Commercial Flight Problems	3
AM 322	Commercial Flight Training†	1

AM 323	Aircraft Operations and Performance.....	3
AM 324	Commercial Flight Training II.....	1
AM 325	Principles of Instrument Flight.....	3
AM 326	Commercial Flight Training III.....	1
AM 327	Commercial Flight Training IV.....	1
AM 404	General Aviation Operations.....	3
AM 427	Multi-Engine Flight Training I.....	1
AM 429	Flight Instructor Training.....	1
AM 431	Multi-Engine Flight Training II.....	1
AM 432	Principles of Professional Flight.....	3
AM 433	Transport Aircraft Flight Training* of.....	2
AM 428	Principles of Flight Instruction.....	3

Normally AM 428 Principles of Flight Instruction (3 hrs.) and AM 429 Flight Instructor Training (1 hr.) are required for the option. However, AM 427 and AM 431 Multi-Engine Training I and II (2 hrs.) and AM 433 Transport Aircraft Flight Training (2 hrs.) may be substituted.

*A separate flight instruction fee is applicable to this course.

Department of Agricultural Engineering

The Agricultural Engineering curriculum is designed to provide the graduate with engineering skills necessary to serve the nation's largest industry—agriculture. In addition to a strong background in mathematics, physical sciences, and basic engineering fundamentals, the student of agricultural engineering receives training in biological and agricultural sciences. Through technical electives in the senior year, one can specialize in one or more areas to include soil and water conservation, power and machinery design, electric power and processing, agricultural structures and environment, food engineering, forest engineering, and waste management and agricultural pollution control.

The curriculum is coordinated by the School of Engineering and the School of Agriculture. Students register in the School of Agriculture. A student in the pre-engineering program can transfer without loss of credit.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.....	5	MH 162	An. Geom. & Cal.....	5	MH 163	An. Geom. & Cal.....	5
BI 101	Prin. of Biology.....	5	CH 103	Gen. Chem.....	5	CH 104	Gen. Chem.....	5
AN 101	Intr. to Ag. Eng.....	2		& Lab.....	5		& Lab.....	5
TS 102	Graph. Comm.....	2	EH 101	English Comp.....	3	EH 102	English Comp.....	3
	& Design.....	2	AN 102	Ag. Engr. Prin.....	2		From Group II.....	1
PE 101	Fnds. of Phys. Ed.....	1	PE 102	Begin. Swim.....	1		Basic ROTC.....	1
	Basic ROTC.....	1		Basic ROTC.....	1			

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.....	5	PS 221	Gen. Physics II.....	4	ME 202	Engr. Mat. Science.....	3
BI 102	Plant Biology.....	5	ME 207	Strength of Mat. or.....	3	CHE 331	Engr. Thermodyn.....	3
PS 220	Gen. Physics I.....	4	CE 207	Mech. of Solids.....	3		or.....	3
ME 205	Appl. Mech. Stat. or.....	3	MH 265	Diff. Equat.....	3	ME 301	Thermodynamics I.....	4
CE 205	Eng. Mech. Stat.....	4	EH 103	English Comp.....	3	ME 321	Dynamics I.....	4
	Basic ROTC.....	1	BY 103	Animal Biol.....	5	PS 222	Gen. Physics II.....	4
				Basic ROTC.....	1	IE 204	Comp. Prog.....	3
							Basic ROTC.....	1

JUNIOR YEAR

AN 303	Soil & Water Engr. I.....	3	AEC 202	Ag. Econ. I.....	5	MH	Math Elective.....	3
ANL 303L	Soil & Water Engr. Lab I.....	3	EE 263	Circuit Anal. II.....	4	AN 306	Elec. Systems.....	3
EE 261	Circuit Anal. I.....	3	AN 302	Mech. of Trac.....	3	AN 304	Drain. & Irrig.....	3
AN 301	Mech. of Farm Mach.....	3		Power.....	3		Ag. Engr. Elective.....	3
AN 307	Structures Des. I.....	3	AN 305	Agric. Proc. Eng.....	3		Elec. Engr. Elective.....	3
CHE 352	Fluid Mech. or.....	4		History Elective.....	3		History Elective.....	3
ME 340	Fluid Mech. History Elective.....	3						

First Quarter			SENIOR YEAR			Third Quarter		
AY	307	Gen. Soils.....	5	Second Quarter			Hum.-Soc.	
SC	202	App. Sp. Comm.....	3	Hum.-Soc. Elective.....			Elective.....	
		Engr. Electives.....	11	Ag. Elective.....			Ag. Elective.....	
				Ag. Engr. Elective.....			Engr. Elective.....	
				Engr. Elective.....				

TOTAL—210 QUARTER HOURS

‡Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

SC 202 will be waived for students who complete a year of Advanced ROTC.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

*Students may choose Technology and Civilization HY 204, 205, 206 or World History 101, 102, 103.

Department of Chemical Engineering

The program leading to the bachelor's degree in chemical engineering consists almost entirely of the study of broad scientific and engineering principles which have numerous applications in the chemical and related industries. The student may select a major interest area during his junior year. These include process engineering, nuclear engineering, biochemical engineering, environmental engineering, biomedical engineering, and production management. Technical electives may be selected in all of these and other areas on an individual basis. Those students who elect to continue their education through one or more advanced degrees are qualified for better positions and often make more rapid progress than those with only the bachelor's degree.

The broad university training provided, when supplemented by professional experience, enables graduates to qualify for positions as engineers in production, research and development, sales engineering, plant design and management. The biomedical engineering option provides an excellent background for students planning to enter medical school.

The curriculum in chemical engineering is offered under both the regular and the cooperative plan. See the Cooperative Education program on page 53.

Curriculum in Chemical Engineering (CHE)

FRESHMAN YEAR									
First Quarter			Second Quarter			Third Quarter			
CH 111	Gen. Chemistry.....	5	CH 112	Gen. Chemistry.....	5	CH 113	Gen. Chemistry.....	5	
MH 161	An. Geom. & Cal.†.....	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5	
EH 101	English Comp.....	3	EH 102	English Comp.....	3	EH 103	English Comp.....	3	
TS 102	Graphic Methods.....	2	HY	History*.....	3	HY	History*.....	3	
CHE 101	Chem. Engr. Fund.....	1	PE	Physical Education.....	1	PE	Physical Education.....	1	
PE	Physical Education.....	1							
SOPHOMORE YEAR									
MH 264	An. Geom. & Cal.	5	CH 303	Organic Chemistry.....	5	CH 304	Organic Chemistry.....	5	
PS 220	Gen. Physics.....	4	PS 221	Gen. Physics II.....	4	PS 222	Gen. Physics.....	4	
HY	History*.....	3	CE 205	Engr. Mech. Statics.....	4	CE 207	Mech. of Solids.....	3	
	Hum.-Soc. Elect.**.....	5	MH 265	Diff. Equations.....	3		Hum.-Soc. Elect**.....	5	
			CHE 213	Comp. in CHE.....	2				

First Quarter			JUNIOR YEAR			Third Quarter		
CH 507	Phys. Chemistry	5	CH 508	Phys. Chemistry	5	CHE 313	CHE Analysis	4
EE 300	Fund. Elec. Eng.	5	CHE 332	Thermo. I	4	CHE 353	Heat Transfer	4
CHE 321	Proc. Prin.	4	CHE 352	Fluid Mechanics	4	CHE 343	Stagewise Proc.	4
CHE 331	Engr. Thermo.	3		Tech. Elective**	3		Hum.-Soc. Elect**	5
				Hum.-Soc. Elect**	3			
Second Quarter			SENIOR YEAR					
CHE 470	Seminar	1	CHE 542	CHE Design I	4	CHE 511	Proc. Control	5
CHE 521	Thermo. II	4	CHE 522	Chem. React. Eng.	4	CHE 543	CHE Design II	6
CHE 551	Mass Transfer	4		Tech. Elective***	9		Tech. Elective***	6
	Tech. Elective**	3					Hum.-Soc. Elect**	2
CHE 582	CHE Lab.	6						

TOTAL—210 QUARTER HOURS

*Selected from the sequence of either HY 204-205-206, or HY 101-102-103.

**See selection of Humanistic-Social Electives. Basic ROTC may be substituted for three hours of Humanistic-Social Electives. Three hours of Advanced ROTC may be substituted for three hours of Technical Electives.

***Technical electives shown above total 21 hours. They may be taken in one of the following six areas. Typical courses in each area from which the 21 hours may be selected with the consent of faculty adviser are listed below.

†Students not prepared for MH 161 must take MH 160 without credit.

Process Engineering			Biochemical Engineering			Nuclear Engineering		
CHE 450	Spec. Topics	TBA	CHE 450	Spec. Topics	TBA	CHE 450	Spec. Topics	TBA
CHE 540	Nuclear Engr.	5		in CHE		CHE 540	Nuclear Engr.	5
CHE 560	Intr. to Plastics	3	CHE 595	Biochem. Engr.	3	EE 371	Electronics I	3
CHE 565	Ind. Waste Water Treatment	4	BI 101	Prin. of Bio.	5	ME 335	Phys. Metallurgy	4
CHE 585	Air Qual. Engr.	5	BY 300	Gen. Microb. I	5	ME 514	Turbo Machines	4
CHE 595	Biochemical Engr.	3	BY 501	Bio. Statistics	5	PS 305	Intr. to Mod. Phys.	6
CH 504	Organic Analysis	5	BY 542	Gen. Virology	5	PS 320	Mod. Phys. for Engr.	3
CH 510	Intr. Inorg. Chem.	5	CH 518	Biochemistry	5	PS 505	Nuclear Physics	5
CH 513	Anal. Chem.	5	CH 519	Biochem. Metabolism	5	PS 545	Plasma Physics	5
EE 371	Electronics I	3	ADS 514	Food Microb.	5	PS 570	Health Physics	5
IE 410	Engr. Statistics	5	HF 540	Food Engineering	5			
IE 438	Occup. Safety	5	HF 545	Food Chem.	3			
ME 536	Ferrous Metal	3	PS 517	Intr. Biophysics	5			
Environmental Engineering			Biomedical Engineering			Production Management		
CHE 450	Spec. Topics	TBA	CHE 450	Spec. Topics	TBA	CHE 450	Spec. Topics	TBA
	in CHE			(Biomed Engr.)			in CHE	
CHE 565	Ind. Waste Water Treatment	4	CHE 595	Biochem. Engr.	3	ACF 215	Fun. of Gen. & Cost Accounting	5
CHE 585	Air Qual. Engr.	4	BI 101	Prin. of Bio.	5	ACF 361	Prin. of Bus. Fin.	5
BI 101	Prin. of Bio.	5	BY 300	General Microb.	5	IE 201	Ind. Admin.	3
BY 300	Gen. Microb. I	5	BY 501	Biological Stat.	5	IE 302	Prod. Cont. Tech.	3
BY 541	Sanitary Microb.	5	CH 513	Anal. Chem.	5	IE 327	Eng. Econ. Anal.	5
CE 305	Water Supply & Disposal Systems	5	CH 518	Biochemistry	5	IE 410	Engr. Statistics	5
MN 344	Env. Law.	4	CH 519	Biochem. Metabolism	5	MN 241	Business Law I	4
CE 509	Envir. Hlth. Engr.	5	EE 371	Electronics I	3	MN 242	Business Law II	4
CE 524	Air Pollution	5	EE 549	Elect. Meth.	3	MN 310	Prin. of Mgt.	5
CH 305	Organic Chemistry	5	EE 549	Elect. Meth.	3	MN 344	Env. Law.	4
CH 513	Anal. Chemistry	5	PY 301	Pharmaceutics I	3	MN 346	Org. Behavior	5
CE 408	Env. Eng. Des.	5	ZY 250	Human Anatomy	5	MN 355	Legal Envir. of Bus.	5
			ZY 300	Genetics	5	MN 385	Prod. Mgt.	5
			ZY 302	Vertebrate Embryology	5	MT 331	Prin. of Marketing	5
			ZY 560	Mammalian Physiology I	5	MT 336	Quant. Anal. Mkt.	5
						MT 372	Econ. of Transp.	5

Department of Civil Engineering

The Civil Engineering curriculum provides a background in mathematics and the physical sciences, in humanistic-social studies, and in the engineering sciences and the interrelated subdisciplines of civil engineering. Technical

electives including design electives permit the undergraduate limited specialization in an area of civil engineering such as construction, environmental engineering, soils, structures, transportation, or water resources.

The civil engineer plays an essential role in the realization of some of the most basic goals, objectives, and needs of society. These relate to man's need for shelter, mobility, water, air, and productive land—the environment in which he lives and works.

Curriculum in Civil Engineering (CE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter	
MH 264	An. Geom. & Cal. ....5
CE 202	Intr. to Computer Methods in CE.....3
CE 205	Engineering Mech.- Statics.....4
PS 221	General Physics II.....4

Second Quarter	
EC 200	Economics.....5
PS 222	General Physics III.....4
MH 265	Diff. Equations.....3
CE 207	Mechanics of Solids.....3
	General Elective*.....3

Third Quarter	
CE 201	Surveying.....5
CE 301	Civil Engineering Analysis.....5
CHE 331	Engineering Thermodynamics.....3
	Hum.-Soc. Elective**.....3

CE 320	Fund. of Transp. Engr.....5
IE 320	Engineering Econ.....5
ME 321	Dynamics I.....4
EH 304	Technical Writing†.....3

JUNIOR YEAR	
CE 304	Theo. of Struc. I.....4
IE 410	Engr. Statistics.....5
CE 315	Engineering Geology.....4
CE 308	Hydraulics.....5
CE 304L	Structures Laboratory.....1

CE 380	Theo. of Struc. II.....5
CE 406	Intr. to Soil Mechanics.....5
CE 312	Hydrology.....4
	Tech. Elective.....3
CE 308L	Hydraulics Laboratory.....1

CE 404	Structural Analysis.....4
CE 305	Water Supply & Disposal.....5
EE 300	Fund. of Electrical Engr.....5
	Tech. Elective.....3
	Hum.-Soc. Elective**.....3

SENIOR YEAR	
CE 405	Water & Waste Water Treatment.....5
CE 417	Soil & Foundation Engr.....3
	Tech. Elective.....3
	Hum.-Soc. Elective*.....6

CE	Design Elective†.....5
	Tech. Elective.....7
	Hum.-Soc. Elective**.....3

TOTAL—210 QUARTER HOURS

*Requires departmental approval. Three hours of Basic ROTC may be substituted.

**See selection of Humanistic-Social Electives. Three hours of Advanced ROTC may be substituted for three hours of Humanistic-Social Electives.

†Design elective must be selected from the approved list.

††Three hours of Advanced ROTC may be substituted.

TECHNICAL ELECTIVES

A list of suggested technical electives may be obtained in the departmental office. Any selection not on the list must be approved by the Head of the Department.

Department of Electrical Engineering

The Electrical Engineering curriculum is organized around six basic areas of study. They are Circuit Analysis, Electronics and Communications, Energy Conversion and Transmission, Electromagnetic Fields, Automatic Control, and Computer Engineering. In addition, technical electives in the senior year provide flexibility in the curriculum to accommodate the diversity of interests and talents among the students. A student, through his choice of technical electives, can concentrate on a topic of individual interest or choose a combination of electives from different areas to maintain a broad program. Electives relevant to each of the specialized topics in Electrical Engineering, along with additional courses which are related to these topics, are grouped on an approved list available from the Electrical Engineering Department.

Curriculum in Electrical Engineering (EE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter

MH 264	An. Geom. & Cal.	5
PS 221	Gen. Physics II	4
EE 201	Intr. to EE	3
	Hum.-Soc. Elective*	5

Second Quarter

ME 205	Statics	4
PS 222	Gen. Physics III	4
MH 265	Linear Diff. Equa.	3
EE 261	Circuit Analysis I	3
	Hum.-Soc. Elective*	3

Third Quarter

EE 263	Circuit Analysis II	4
ME 207	Strength of Mat's I	3
MH 266	Linear Algebra	3
PS 320	Mod. Phy. for Engr.	3
EE 264	Lin. Cir. An. II Lab.	1
	Hum.-Soc. Elective*	3

JUNIOR YEAR

EE 362	Linear Systems	5
ME 321	Dynamics I	4
EE 391	Electromag. I	3
IE 311	Engr. Stat. I	3
	Hum.-Soc. Elective*	3

EE 351	Linear Feedback Sys.	4
EE 330	An. & Des. Logic Cir.	4
EE 371	Electronics I	3
EE 392	Electromag. II	3
EH 304	Tech. Writing	3

EE 352	Nonlinear Sys.	4
EE 335	Comp. Organ.	4
EE 374	Electronics II	4
EE 385	Power Sys. Analysis I	4

SENIOR YEAR

EE 475	Electronics III	5
EE 481	Energy Conv.	5
EE 430	Comp. Sys. Design	4
IE 327	Engr. Econ. An.	5

EE 492	Electromag. III	4
ME 301	Thermodynamics I	4
EE 489	Energy Conv. Lab.	2
	Tech. Elective**	3
	Hum.-Soc. Elective*	3

EE 441	Comm. Theory	5
	Tech. Elective**	9
	Hum.-Soc. Elective*	3

TOTAL—210 QUARTER HOURS

Basic ROTC may be substituted for three hours of Humanistic-Social Electives. Advanced ROTC may be substituted for EH 304 and three hours of Technical Electives.

*Humanistic-Social Electives selected from approved list.

**Selected from an approved list obtained from the Electrical Engineering Department Office.

Department of Industrial Engineering

Industrial Engineering differs from other branches of the engineering profession in three basic ways. First, it covers all types of industrial, commercial, and service activity. Second, it gives substantial emphasis to the role of people as well as machines and materials in systems design. Third, it becomes heavily involved in the economic and financial aspects of the problems it considers. While the Industrial Engineer is still concerned with production systems, many non-industrial organizations have recognized the value of Industrial Engineering techniques, and Industrial Engineers are practicing in health, marketing, financial, governmental, military, transportation, educational, agricultural, and consulting organizations. Furthermore, they have increasingly become involved in interdisciplinary activities.

The Industrial Engineering curriculum emphasizes the systems approach to design, operation, and control, and provides the student with competencies in quantitative and qualitative analysis and solution procedures to the resource utilization, data processing, information flow, management, economic, and human factors problems associated with almost any system. The curriculum includes departmental courses in the areas of: computer systems and programming, simulation, mathematical optimization methods, probability and statistics, operation research, production processes, facilities design, human performance, and the design of man's work environment and work methods. An elective program equivalent to approximately two quarter's course work permits the student to pursue further topics of personal and professional interest.

A wide variety of employment opportunities is available to the Industrial Engineer since his competencies are required by almost all manufacturing and

service organizations. Additionally, Industrial Engineering is excellent training for top management positions.

An option in computer science is available to the student wishing to specialize in this important area of Industrial Engineering practice.

Curriculum in Industrial Engineering (IE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter	
IE 202	Ind. Engr. Fund.....3
MH 264	An. Geom. & Cal.....5
PG 211	Gen. Psychology.....5
PS 221	Gen. Physics II.....4

Second Quarter	
IE 300	Computer Prog.....3
MH 265	Diff. Equations.....3
EC 200	Economics I.....5
PS 222	Gen. Physics III.....4
	Basic ROTC or
	Elective.....3

Third Quarter	
IE 311	Statistics I.....3
IE 327	Engr. Econ. Anal.....5
PS 320	Modern Physics.....3
	Basic ROTC or
	Elective.....3
	Hum.-Soc. Elec.....3

JUNIOR YEAR

IE 323	Engr. Stat. II.....5
IE 305	Info-Dec. Sys.....3
PG 321	Exp. Psych II:
	Perception.....4
ME 301	Thermodynamics I.....4
	Hum.-Soc. Elective.....3

IE 308	Ergonomics I.....4
IE 333	Engr. Stat III.....4
IE 335	Linear Prog.....4
EE 261	Linear Circuits
	Analysis I.....3
	Tech. Elective.....3

IE 408	Ergonomics II.....5
IE 415	Oper. Research
	Models.....5
EE 263	Lin. Circuits
	Analysis II.....4
	Tech. Elective.....3

SENIOR YEAR

IE 416	Simulation.....3
IE 422	Prod. Cont.
	Func. I.....4
ME 205	Statics.....4
	Tech. Elective.....5

IE 425	Prod. Cont.
	Func. II.....3
IE 427	Oper. & Fac. Des. I.....3
ME 207	Stren. of Mat. I.....3
	Tech. Elective.....6

IE 428	Oper. & Fac.
	Des. II.....3
ME 321	Dynamics.....4
	Free Elective.....5
	Tech. Elective.....3

TOTAL—206 QUARTER HOURS

*Another basic science course may be substituted on a "course for course basis" upon approval of the student's adviser.

SUGGESTED ELECTIVES

A pamphlet describing the student's elective options and suggested courses is available in the IE department offices. Elective courses are available in all fields of engineering represented on campus, computer science, operations research, statistics, production analysis, management economics, psychology and human performance, mathematics, environmental quality, and ecology. Six hours of advanced ROTC may be substituted for five hours of free electives and one hour of humanistic-social elective.

Computer Science Option

Freshman and Sophomore years same as in Industrial Engineering Curriculum.

JUNIOR YEAR

First Quarter	
IE 323	Engr. Stat. II.....5
IE 305	Info-Dec. Sys.....3
PG 321	Exp. Psych II:
	Perception.....4
ME 301	Thermodynamics I.....4
	Hum.-Soc. Elective.....3

Second Quarter	
IE 308	Ergonomics I.....4
IE 333	Engr. Stat III.....4
IE 335	Linear Prog.....4
IE 384	Data Structures.....3
EE 261	Linear Circuits
	Analysis I.....3

Third Quarter	
IE 408	Ergonomics II.....5
IE 415	Oper. Research
	Models.....5
IE 385	Comp. Prog.
	Sys. I.....3
EE 263	Linear Circuits
	Analysis II.....4

SENIOR YEAR

IE 416	Simulation.....3
IE 422	Prod. Cont.
	Func. I.....4
ME 205	Statics.....4
MH 560	Intr. Num. Anal.....5

IE 425	Prod. Cont.
	Func. II.....3
IE 427	Oper. & Fac. Des. I.....3
ME 207	Stren. of Mat. I.....3
EE 330	An. & Des. Logic Cir.....4
	Computer Science
	Elective*.....3

IE 428	Oper. & Fac.
	Des. II.....3
ME 321	Dynamics.....4
	Computer Science
	Elective*.....7

TOTAL—206 QUARTER HOURS

*These hours must come from the following two groups of courses with at least one course from each group: (1) IE 301, IE 555, IE 585, (2) IE 553, IE 586, MH 331, MH 505, MH 561.

Computer Science And Engineering

The School of Engineering gives instruction in Computer Science and Computer Engineering to provide elective courses for Engineering, Arts and Sciences, and Business students who want to specialize in Computer Science or Computer Engineering.

Computer Science is the study of representation and transformations of information structures, programming languages, computational models, computer design and organization, translators, information processing systems, numerical mathematics, data processing, simulation, and information retrieval. Emphasis is placed on software and programming.

Computer Engineering is that branch of engineering concerned with the organization, design, and utilization of digital processing systems as general-purpose computers or as components of larger systems. Both hardware and software aspects of the systems are of concern.

For those students who wish to channel their studies toward digital computation and computing machinery, the following lists of electives are available from the indicated departments:

COMPUTER SCIENCE COURSES

EE 202	Timesharing and Terminal Systems	2	IE 301	Information Retrieval & Computer Programming	3
EE 330	Analysis & Design of Logic Circuits	4	IE 316	Electronic Data Processing Systems Design	4
EE 335	Computer Organization	4	IE 384	Data Structures	3
EE 430	Computer System Design	4	IE 385	Computer Programming Systems I	3
EE 520	Fund. of Computer Graphic Systems	4	IE 416	Simulation	3
EE 521	Introduction to Artificial Intelligence & Robotics	4	IE 555	Advanced Computer Programming	3
EE 524	Microcomputers	4	IE 556	Intermediate Simulation	3
EE 526	Minicomputer Laboratory	1	IE 585	Computer Programming Systems II	1
EE 527	Systems Prog. & Operating Systems	3	IE 586	Information Organization & Retrieval	3
EE 528	Compiler Construction	3	IE 587	Formal Theory of Computer Languages I	3
EE 530	Computer Engineering Seminar	TBA	IE 588	Fundamental Algorithms	3
IE 202	Industrial Engineering Fundamentals	3	MH 560	Introduction to Numerical Analysis	5
IE 204	Computer Programming	3	MH 561	Numerical Matrix Analysis	5
IE 300	Computer Programming & Introduction to Information Decision System	3			

COMPUTER ENGINEERING COURSES

EE 202	Timesharing and Terminal Systems	2	EE 551	Hybrid Computation	5
EE 330	Analysis & Design of Logic Circuits	4	IE 202	Industrial Engineering Fundamentals	3
EE 335	Computer Organization	4	IE 204	Computer Programming	3
EE 430	Computer System Design	4	IE 301	Information Retrieval & Computer Programming	3
EE 520	Fundamentals of Computer Graphics	4	IE 316	Electronic Data Processing Systems Design	3
EE 521	Introduction to Artificial Intelligence & Robotics	4	IE 384	Data Structures	3
EE 523	Fault-Diagnosis of Digital Systems	3	IE 385	Computer Programming Systems I	3
EE 524	Microcomputers	4	IE 555	Advanced Computer Programming	3
EE 526	Minicomputer Laboratory	1	IE 585	Computer Programming Systems II	3
EE 528	Compiler Construction	3	MH 560	Introduction to Numerical Analysis	5
EE 530	Computer Engineering Seminar	TBA	MH 561	Numerical Matrix Analysis	5

Department of Mechanical Engineering

The basic engineering science fields of engineering mechanics, materials science, thermodynamics, fluid mechanics, and heat and mass transfer are covered in depth in this curriculum to give students understanding and the ability to solve problems in these areas. In addition, there are professional subjects offering instruction in combustion engines, including gas turbines

and rockets, power plants, air conditioning, refrigeration, automatic controls, turbomachinery and machine design. A series of courses in electrical subjects is also included to equip the graduate with needed fundamental knowledge in this rapidly expanding field.

Modern design courses at senior level, employing both the group project and the individual project techniques, provide an opportunity for the student to solve typical engineering problems, requiring the development of skill and cooperation in creative design, analysis, and synthesis.

Technical electives are provided in the senior year to enable students to specialize to a limited extent, including a sequence in optimization theory.

Curriculum in Mechanical Engineering (ME)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	PS 222	General Physics III	4	ME 301	Thermodynamics I	4
PS 221	General Physics II	4	ME 202	Engr. Materials	3	ME 321	Dynamics I	4
ME 205	Applied Mechanics-		ME 207	Science-Structure	3	EE 261	Linear Circuit	3
Statics	4		ME 207	Strength of Matls. I	3	ME 362	Engr. Math. I	3
Basic ROTC or Elect.	4		MH 265	Linear Diff. Equat.	3	ME 309	Correlative Experimental Mechanics	2
			ME 211	Engr. Methods	2		Basic ROTC or Elect.	1
				Basic ROTC or Elect.	1			

JUNIOR YEAR

ME 322	Dynamics II	4	ME 323	Dynamics of Machs.	4	ME 335	Engr. Materials	
ME 316	Strength of Matls. II	4	ME 304	Engr. Materials	3	ME 341	Fluid Mech. II	4
ME 308	Computations Lab.	3	ME 302	Science-Properties	3	ME 303	Thermodynamics III	3
EE 263	Linear Cir. Analy. II	4	ME 340	Thermodynamics II	3	PS 320	Modern Phy. for Engr.	3
SC 202	App. Sp. Comm. †			Fluid Mechanics I	3		Hum.-Soc. Elect.*	3
EH 304	Tech. Writing †	3		Electrical Science				
				Elective**	3			

SENIOR YEAR

ME 521	Heat Transfer	4	ME 515	Thermodynamics of		ME 451	Advanced Projects	3
ME 439	Mech. Engr. Design I	4		Power Systems	4	ME 420	Thermal Systems	
ME 527	Dynamics of		ME 440	Mech. Engr.			Laboratory	2
	Physical Systems	4		Design II	3		Hum.-Soc. Elective*	9
	Hum.-Soc. Elective*	3	ME 522	Transport Processes	3		Technical Elective	4
	Technical Elective	3	ME 412	Measurements Lab.	3			
				Hum.-Soc. Elective*	3			
				Technical Elective	3			

TOTAL—210 QUARTER HOURS

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) or EH 304 (3 hrs.) and three additional hours approved by the Department Head.

*See selection of Humanistic-Social Electives.

**Electrical Science Elective must be EE 301 Engineering Instrumentation or EE 371 Electronics I.

NOTE: The recommended technical elective sequence in optimization theory is MH 310 and ME 502. Additional courses following this sequence are available.

SUGGESTED TECHNICAL ELECTIVES

Selected from approved list which can be obtained from the Mechanical Engineering Department or the office of the Dean of Engineering.

Materials Engineering

The curriculum in Materials Engineering is administered by the Department of Mechanical Engineering of the School of Engineering. It is an interdisciplinary curriculum conducted cooperatively by academic departments of the School of Engineering and the School of Arts and Sciences through a faculty Materials Engineering Curriculum Committee.

Materials Engineering includes both the design of materials and materials processes to meet specific needs. Materials engineers are employed in the basic metallurgical, ceramics, plastics, electronics, aerospace, mechanical, process, chemical, and nuclear power industries.

The curriculum in Materials Engineering includes the basic sciences, engineering sciences, and particularly the science of the relationship of structure to properties.

Materials Engineering courses include the subjects of ceramic, metallic, and plastic materials design with the emphasis placed upon the structure of each type and its influence on the properties and performance in service. Fundamental relationships are emphasized to prepare the engineer to meet effectively modern design challenges that will be encountered.

Curriculum in Materials Engineering (MTL)

FRESHMAN YEAR

(See Pre-Engineering Curriculum)

SOPHOMORE YEAR

First Quarter

MH 264	Ap. Geom. & Cal.	5
PS 221	Gen. Physics II	4
ME 205	Applied Mech. Statics	4
	Basic ROTC or Elect.	3

Second Quarter

PS 222	Gen. Physics III	4
MH 265	Linear Diff. Equations	3
MTL 202	Engr. Materials	3
	Science-Structure	3
ME 207	Strength of Matls. I	3
	Basic ROTC or Elect.	3

Third Quarter

CH 507	Physical Chem.	5
ME 301	Thermodynamics I	4
MTL 304	Engr. Materials	3
	Science-Properties	3
ME 308	Computation Lab.	3
EE 261	Lin. Cir. Anal.	3

JUNIOR YEAR

CH 508	Physical Chem.	5
MTL 335	Engr. Matls.	3
	Science-Physical	3
	Metallurgy	4
EE 263	Linear Circuit	4
	Analysis II	4
ME 521	Heat Transfer	4

MTL 338	Phase Diagrams	4
MTL 536	Engr. Materials	3
	Science-Ferrous	3
	Metallurgy	3
MTL 515	Polymer Tech. I	4
SC 202	App. Sp. Comm. or	4
EH 304	Tech. Writing I	3
	Technical Elective	5

MTL 336	Physical Anal.	4
	of Matls. I	4
MTL 425	Thermo. of	4
	Matls. Syst.	4
MTL 448	Intr. to Ceramics	3
MTL 516	Polymer Tech. II	3
	Hum.-Soc. Elect.*	3

SENIOR YEAR

MTL 337	Phys. Anal. of	4
	Matls. II	4
MTL 445	Transfor. in	4
	Condensed Phases	4
	Technical Elect.	5
	Hum.-Soc. Elect.*	5

MTL 435	Phys. Anal. of	4
	Matls. III	4
MTL 575	Rate Processes	3
	in Matls.	3
MTL 570	Electrical Prop.	3
	of Materials	3
	Hum.-Soc. Elect.*	6
	Technical Elect.	1

MTL 446	Theoretical	3
	Matls. Engr.	3
MTL 447	Mechanics of	4
	Engr. Matls.	4
ME 451	Advanced Projects	3
MTL 513	Intr. to X-ray	5
	Crystallography	5
	Hum.-Soc. Elect.*	3

TOTAL—210 QUARTER HOURS

*Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) or EH 304 (3 hrs.) and three additional hours approved by the Chairman of the Materials Engineering Curriculum Committee.

*See selection of Humanistic-Social Electives

NOTE: The sequence CH 111 and CH 112 may be substituted for the sequence CH 103/CH 103L and CH 104/CH 104L.

SUGGESTED TECHNICAL ELECTIVES

Selected from approved list which can be obtained from the chairman of the Materials Engineering Curriculum Committee.

Department of Textile Engineering

The programs in the Department of Textile Engineering are designed to be sufficiently flexible to serve the needs of the student who seeks a career in the Textile Industry. Textiles is a truly multi-disciplinary program, and frequently a career in this field will draw on knowledge from the sciences, arts, combinations of these, economics, business and others.

The curricula are planned to provide for the needs of students as perceived by them and assisted by the faculty of the Department.

Well equipped laboratories complement the lecture program. These laboratories represent the types of equipment, bench study and research capabilities so vital to the learning of and contributing to a career in the industry.

The size and diversity of textiles and the allied industries provide careers in manufacturing, research, machinery design, chemicals and dyestuffs, sales, styling and design, technical service and others. Too, the student has the opportunity to prepare for graduate school if he or she desires.

For those students who want to plan their education path in conjunction with industrial experience the Alabama textile industry cooperates with the Department of Textile Engineering through the Cooperative Education Program as described on page 53.

The Textile Engineering Department conducts both applied and fundamental research. In cooperation with the Engineering Experiment Station, and other segments of the University, the Department serves textiles through the utilization of its facilities. In conjunction with research undertaken by the faculty, undergraduates may have the opportunity to conduct research in areas of their special interest. Graduate students from other disciplines are welcome to conduct approved research that may be applied toward their graduate program requirements.

The Department of Textile Engineering offers three curricula to prepare for a career in one of the many facets of the industry. Textile courses in these curricula are combined with courses offered by other departments of the University to provide basic instruction in the fundamental sciences, engineering, technology and humanistic-social studies. The three curricula are:

Textile Engineering—The curriculum in Textile Engineering offers study in basic engineering. It includes engineering science, humanistic-social studies, and the textile subjects needed for a fundamental understanding of the textile processes, materials and industry. It prepares students for graduate study and careers in textile research, engineering, production and management in the primary textile industry and allied industries, such as the manufacture of textile machinery and man-made fibers.

Textile Chemistry—Students in this curriculum study the chemistry and physics of natural and man-made fibers and the theory and practice of textile dyeing and finishing. It prepares students for graduate work and careers as chemists and dyers in the textile, man-made fibers, dyestuff and other industries allied to textiles.

Textile Management—This curriculum prepares students for production, administrative, and managerial positions in a textile career. In their junior and senior years students major in production, sales, or design according to their professional needs. Each of the three curricula offered provide students an opportunity to select courses in other disciplines through technical elective sequences. The course sequences may be in disciplines such as Consumer Affairs, Economics, Industrial Engineering, Management, and Marketing.

Curriculum in Textile Chemistry (TC)

FRESHMAN YEAR														
First Quarter					Second Quarter					Third Quarter				
CH	111	Gen. Chem.	5		CH	112	Gen. Chem.	5		CH	113	Gen. Chem.	5	
MH	160	Algebra & Trig.	5		MH	161	An. Geom. & Cal.	5		MH	162	An. Geom. & Cal.	5	
EH	101	English Comp.	3		EH	102	English Comp.	3		EH	103	English Comp.	3	
TE	101	Intr. Textiles	3		HY		History*	3		HY		History*	3	
		Basic ROTC or Elec.	1				Basic ROTC or Elec.	1				Basic ROTC or Elec.	1	
PE		Physical Education	1		PE		Physical Education	1		PE		Physical Education	1	
SOPHOMORE YEAR														
MH	163	An. Geom. & Cal.	5		MH	264	An. Geom. & Cal.	5		PO	209	Intr. Am. Govt.	5	
TE	231	Tex. Fibers I.	5		CH	205	An. Chemistry	5		PA	202	Ethics & Soc.	5	
CH	204	An. Chem.	3		TE	232	Tex. Fibers II.	5		TE	211	Yarn Form Sys.	5	
CH	204L	An. Chem. Lab.	2				Basic ROTC or Elec.	1		SC	202	Appl. Sp. Comm.	3	
HY		History*	3									Basic ROTC or Elec.	1	
		Basic ROTC or Elec.	1											
JUNIOR YEAR														
PS	205	Intr. Physics	5		PS	206	Intr. Physics	5		CH	303	Organic Chem.	5	
TE	221	Fabric Form. Sys.	5		TE	212	Spec. Top. on Yn. Mfg.	4		TE	321	Knit Structures	3	
TE	241	Dye. & Finish.	5		TE	222	Woven Structures	3		TE	342	An. Instrum. in		
TE	213	Prep. of Yarns for			TE	242	Chem. Tech. of Blch					Textiles	3	
		Fab. Form.	2				Dye. & Fin.	3		EH	304	Tech. Writing†	3	
							Hum-Soc. Elective	3				Hum-Soc. Elective	3	
SENIOR YEAR														
CH	304	Organic Chem.	5		CH	507	Physical Chem.	5		CH	508	Physical Chem.	5	
TE	350	Test. of Tex. Matl.	5		TE	441	Adv. Dyeing	5		TE	380	Textile Costing	5	
		Technical Elective	5		TE	351	Analysis of Tex.					Technical Elective	5	
							Fab. Struct.	5						

TOTAL—205 QUARTER HOURS

*Selected from the sequence of either HY 204-205-206, or HY 101-102-103.

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) & EH 304 (3 hrs.)

Curriculum in Textile Engineering (TE)

FRESHMAN YEAR			FRESHMAN YEAR			FRESHMAN YEAR		
First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
CH 103	Fnds. of Chem. I.	4	CH 104	Fnds. of Chem. II.	4	PS 220	Gen. Physics I.	4
CH 103L	Gen. Chem. Lab.	1	CH 104L	Gen. Chem. Lab.	1	EH 103	English Comp.	3
EH 101	English Comp.	3	EH 102	English Comp.	3	TE 101	Intr. Textiles	3
	Free Elective	1	TS 102	Graph. Com. & Des.	2		Basic ROTC or Elect.	1
	Basic ROTC or Elect.	1		Free Elective	1	PE	Physical Education	1
PE	Physical Education	1	PE	Basic ROTC or Elect.	1			
			PE	Physical Education	1			
SOPHOMORE YEAR			SOPHOMORE YEAR			SOPHOMORE YEAR		
TE 231	Tex. Fibers I.	5	TE 232	Tex. Fibers II.	5	TE 211	Yarn Form. Sys.	5
MH 264	An. Geom. & Cal.	5	PS 222	Gen. Physics III.	4	TE 221	Fabric Form. Sys.	5
PS 221	Gen. Physics II.	4	MH 265	Linear Diff. Eq.	3	ME 205	App. Mech. Statics	4
HY	History*	3	ME 202	Structures	3	HY	History*	3
	Basic ROTC or Elect.	1	HY	History*	3		Basic ROTC or Elect.	1
				Basic ROTC or Elect.	1			
JUNIOR YEAR			JUNIOR YEAR			JUNIOR YEAR		
ME 301	Thermodynamics I.	4	EE 263	Circuit Analysis II	4	TE 241	Dye & Finishing	5
TE 212	Spec. Topics on		ME 207	Strngth. of Matls.	3	ME 321	Dynamics I.	4
	Yarn Mfg.	4	TE 321	Knit Structures	3	EE 301	Instrumentation	3
EE 261	Circuit Analysis I	3	PS 320	Mod. Phys/Engrs.	3	ME 340	Fluid Mech. I.	3
TE 222	Woven Struct.	3	IE 201	Ind. Admin.	3	IE 204	Computer Prog.	3
TE 213	Prep. of Yarns							
	For Fab. Form.	2						
SENIOR YEAR			SENIOR YEAR			SENIOR YEAR		
EC 200	Gen. Economics	5	PG 211	Gen. Psychology	5	TE 380	Tex. Costing	5
TE 350	Test. of Tex. Matls.	5	TE 351	An. of Text.		TE 322	Non-Conven. Fab.	3
EH 304	Tech. Writing*	3		Fab. Struct.	5		Technical Elective**	5
SC 202	App. Sp. Comm.	3	TE 352	Quality Control	3		Hum-Soc. Elective	3
				Technical Elective**	4			

TOTAL—205 QUARTER HOURS

*Selected from the sequence of either HY 204-205-206, or HY 101-102-103.

**Selected from approved sequence.

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and EH 304 (3 hrs.)

Curriculum in Textile Management (TM)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre. Cal. W. Trig.	5	TE 141	Textile Chemistry	5	TE 221	Fab. Form. Systems	5
TE 101	Intr. To Textiles	3	MH 161	An. Geom. & Cal.	5	CH 103	Fund. of Chem. I	4
EH 101	English Comp.	3	EH 102	English Comp.	3	CH 103L	Gen. Chem. Lab.	1
TS 102	Com. & Des. Graphic	2	HY 205	Tec. & Civil. II	3	EH 103	English Comp.	3
HY 204	Tech. & Civil. I	3	PE	Physical Education	1	HY 206	Tech. & Civil. III	3
PE	Physical Education	1				PE	Physical Education	1

SOPHOMORE YEAR

TE 211	Yarn Form. Systems	5	TE 241	Dye. & Finishing	5	EC 202	Economics II	5
TE 231	Textile Fibers I	5	TE 232	Textile Fibers II	5	PS 205	Intr. Physics	5
CH 104	Fund. of Chem. II	4	EC 200	Gen. Economics	5	TE 222	Woven Struct.	3
CH 104L	Gen. Chem. Lab.	1	TE 212	Spec. Topics Yarn Mfg	4	TE 242	Chem. Tech. Bleach	3
IE 204	Comp. Prog.	3				TE 213	Dye. & Finish	3
							Prep. Yarns for Fab. Form.	2

JUNIOR YEAR

IE 220	Applied Stats.	5	ACF 215	Fund. Acctg.	5	TE 380	Textile Costing	5
TE 321	Knit Structures	3	TE 350	Test. of Tex. Matl.	5	SC 211	Speech Comm. I	5
TE 342	Analyt. Instrum. In Textiles	3	TE 325	Design. Tex. Fab.	4	TE 351	Anyl. of Tex. Fab. Struct.	5
TE 311	Textured Yarns	2	EH 304	Tech. Writing I	3	TE 352	Tex. Qual. Control	3
TE 322	Non Conv. Fab. Struct.	3						

SENIOR YEAR

TE 490	Undergrad. Resch. I	5	TE 491	Undergrad. Resch. II	5	TE 481	Plant Design, Oper. & Contr. II	4
TE 480	Tech. Electives*	9	TE 480	Plant Design, Oper. & Contr. I	4		Tech. Electives*	10
	Free Electives†	3		Tech. Electives*	6		Free Electives	3
				Free Electives	3			

TOTAL—209 QUARTER HOURS

†Nine hours of ROTC (Basic 6, Advanced 3) may be substituted for SC 211 (5 hours), EH 304 (3 hours), and 1 hour of free elective.

*Selected from an approved sequence.

Auburn School of Aviation

The Auburn School of Aviation was established in 1942 as a unit of the School of Engineering to offer flight education for students of the University and the general public; and to serve the citizens of Alabama and the South. The School cooperates fully with the Federal Aviation Administration and other organizations in conducting special aviation research and education programs.

In conjunction with the Aerospace Engineering Laboratories located on the campus, the airport serves as an Aerospace laboratory of practical training for students enrolled in the curricula of Aviation Management and Aerospace Engineering. Flight courses offered include private, commercial, multi-engine, instrument, flight instructor, and airline transport. These courses are offered for credit in the Aviation Management Curriculum.

The University owns a 322-acre airport, conveniently located within three miles of the campus, with two lighted, 4,000-foot, paved runways; a two-story Administration Building; two large hangars; and a five-unit T-Hangar. The School currently operates ten single engine aircraft, two twin engine aircraft, and one flight simulator.

In addition to flight education, other services such as airplane storage and servicing are provided at the airport. The School also provides air transportation anywhere in the United States for University faculty and staff.

The Auburn School of Aviation is fully certified by the FAA as an Approved Ground and Flight School with examining authority for private pilots. The FAA has designated the Director of the Auburn School of Aviation as an Aircraft Inspection Representative and the Associate Director and Professional Flight Coordinator as Pilot Examiners.

School of Home Economics

RUTH L. GALBRAITH, *Dean*

HOME ECONOMICS is a professional program with its roots in the arts, sciences, and humanities. It is a complex of studies serving many purposes—broad liberal education, preparation for careers, and a background for home and family living. Areas of specialization are concerned with many aspects of environment, health, and human development. With emphasis on both breadth of knowledge and its application to the solution of human problems, Home Economics offers professional or pre-professional preparation for an increasing variety of positions with opportunities available in education, business, industry, and government.

Programs of study leading to the Bachelor of Science degree can be planned within eleven curricula in the School of Home Economics. These curricula are designed with flexibility to meet the needs of students with varying interests. The School includes the Departments of Consumer Affairs, Family and Child Development, and Nutrition and Foods.

Department of Consumer Affairs

The Department of Consumer Affairs focuses on the near physical environment and resources, including personal interaction with this environment. Six majors are offered in this department: Clothing, Textiles, and Related Art; Fashion Merchandising; Housing; Interior Furnishings and Equipment; Family Resource Management; and Consumer and Family Economics. These curricula lead to careers in business and government which apply science and technology to study consumer needs, to evaluate consumer products, and to inform consumers of the findings.

Clothing, Textiles, and Related Art (CTC, CTD, CTT)

Clothing, Textiles, and Related Art is a professional three-option curriculum providing preparation in areas of specialization related to students' professional goals. Diversification within the major allows application of knowledge in such varied fields as textile and apparel design, production and promotion; textile science; fashion journalism; and consumer-producer relations. A unique interdisciplinary potential involving Clothing and Textiles, Textile Engineering, the School of Business, the Agricultural Experiment Station (for research) and the Cooperative Extension Service exists on one campus located in a textile area.

Curriculum in Clothing, Textiles, and Related Art (CT)

Options: Clothing (CTC), Textile Design (CTD), Textile Science (CTT)

FRESHMAN YEAR								
First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra**	5	CH 103	Fund. of Chem. I	4	CA 105	Fund. of Clothing	5
CA 116	Art for Living I	3	CH 103L	Gen. Chem. Lab.	1	CH 104	Fund. of Chemistry II	4
CA 116L	Art for Living Lab.	2	CA 115	Clothing & Man	3	CH 104L	Gen. Chem. Lab.	1
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY/AT**		3	HY/AT**		3	HY/AT**		3
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
EC 200	Economics I.....5	CH 203	Organic Chemistry**...5	CA 225	Textiles.....5
PG 211	Psy. or FED 213.....3	CA 113	Housing for Man.....3	SY 201	Intr. to Soc.....5
	Human Growth and Development.....5	EH 254	English Lit. or	SC 202	App. Speech Comm.....3
EH 253	English Lit. or	EH 260	261. or 262 Sur.		Elective.....5
EH 260	or 261. or 262. Sur.	NF 112	Lit. West World.....3		
FCD 157	Lit. West World.....3		Nutrition & Man.....3		
	Fam. & Human Dev.....3		Prof. Elective*.....3		

JUNIOR YEAR

PS 200	or 205 Physics.....5	BY 105	Microbio and Mod. Man.....5	CA 345	Creative Crafts or
JM 315	Tech. Journalism.....3	CA 313	Home Furnishings.....5	CA 385	Creative Weaving.....3
	Prof. Electives.....8	CA 323	Man the Consumer.....3		Prof. Electives.....13
			Elective.....5		

SENIOR YEAR

Prof. Electives.....8	CA 515	History of Textiles or	CA 431	Man-Environment Relations.....2
Electives.....11	CA 525	History of Costume.....5		Electives.....16
		Prof. Electives.....13		

TOTAL—205 QUARTER HOURS

*Students choosing Clothing Option take CA 205.

**Students choosing Textile Science Option take CH 207, 208, Org. Chem. and MH 160 Pre-Cal. w/Trig.

***Students may take any combination of World History, HY 101-102-103; Tech. and Civilization, HY 204-205-206; Hist. of Art, AT 171-172-173.

CLOTHING OPTION-APPROVED PROFESSIONAL ELECTIVES

34 hours selected from ANT 203; CA 205, 206, 209, 216, 266, 316, 325, 395, 480, 490, 505, 511, 516, 524, 538, 555, 556, EC 274, 574; PG 330, 561; SY 305, 311; JM 221, 421.

TEXTILE DESIGN OPTION—APPROVED PROFESSIONAL ELECTIVES

37 hours selected from AT 111, 112, 113, 121, 122, 123; CA 205, 216, 303, 343, 345, 375, 395, 465, 486, 480, 490, 505, 515, 525, 535, 555, 556, 575, 576A, 576B, 576C, 586, 587, 588, TE 221, 222, 421.

TEXTILE SCIENCE OPTION—APPROVED PROFESSIONAL ELECTIVES

37 hours selected from BY 501; CA 490, 535, 560, 575, 583; CH 204, 303, 304, 305, 316; MH 161, 162, 163; PS 206; TE 232, 242, 342, 421, 441.

Students with other specialized professional goals in Clothing, Textiles, and Related Art should plan an appropriate coordinated program of electives to provide needed knowledge and competence.

Students interested in combining Clothing and Textiles with teacher certification, consult adviser for specific course requirements.

All electives must be approved by the student's adviser.

Consumer and Family Economics (CFE)

The curriculum in Consumer and Family Economics prepares students for professional positions that deal primarily with the economic problems of individuals and families. These include positions in the following areas: credit counseling in banks, housing authorities, social service agencies, and independent credit counseling services; consumer protection with local, state, and federal agencies; and business and industry.

Curriculum in Consumer and Family Economics (CFE)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 160	Pre-Cal W/Trig.....5	BI 101	Prin. of Biology.....5	BI 104	Bio. in Hum. Affairs.....5
CA 116	Art for Living I.....3	CA 113	Housing for Man.....3	PG 211	Psychology.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	CA 115	Clothing & Man.....3
FCD 157	Fam. & Human Dev.....3	NF 112	Nutrition and Man.....3	EH 103	English Comp.....3
PE	Physical Education.....1	PE	Physical Education.....1	PE	Physical Education.....1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
EC	200	Economics I.....5	EC	202	Economics II.....5	FCD	270	Family II.....4
HY	204	Tech. & Civ. I.....3	SY	201	Intr. to Soc.....5	HY	206	Tech. & Civ. III.....3
SC	202	App. Speech Comm.....3	HY	205	Tech. & Civ. II.....3			Prof. Elective.....5
		Hum/Fine Arts**.....5			Prof. Elective.....5			Math/Nat. Sci.**.....5

JUNIOR YEAR

CA	233	Home Equip. I.....5	MN	310	Prin. of Mgt.....5	EC	551	Intr. Microecon.....5
MN	241	Business Law I.....4	MT	331	Prin. of Mkt.....5	CA	553	Cons. & the Market.....3
CA	323	Man the Consumer.....3			Prof. Elective.....5	CA	570	Mgt. Prob. in Home.....3
EH	345	Bus. Prof. Writ. or.....3			Elective.....3	CA	431	Man-Environ. Rel.....2
JM	315	Tech. Journalism.....3						Prof. Elective.....5
		Elective.....3						

SENIOR YEAR

CA	514	Soc. Prob. of Housing.....5	CA	530	Cons. Oriented Legis.....5	CA	336	Field Exp. in CA.....10
CA	541	Fam. Finan. Mgt.....5			Prof. Electives.....10			or
		Elective.....4			Elective.....3	CA	490	Ind. Study and.....8
		Prof. Elective.....5						Prof. Elective.....2
								Prof. Electives.....6

TOTAL—205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.
 **Liberal Education Electives.

APPROVED PROFESSIONAL ELECTIVES

21 or 23 hours should be chosen from CA 205, 303, 343, 355, 443, 533; FCD 306, 310, 477; NF 104, 204, 358.

20 hours should be chosen from ACF 211, 212, 314, 320; EC 274, 340, 350, 360, 433, 552, 554, 556; MN 344, 355; MT 341, 436; RSY 362, 561, 562; SY 220, 370, 501; SW 375, 575.

Family Resource Management (FRM)

The Family Resource Management major is designed for students interested in a broad general education in home economics. Professional preparation is offered for positions in Cooperative Extension Service, home service and other areas of business requiring a background in home management and social science.

Curriculum in Family Resource Management (FRM)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH	140	College Algebra.....5	BI	101	Prin. Bio.....5	BI	104	Bio. Hum. Affairs.....5
CA	116	Art for Liv. I.....3	NF	104	Prin. Food Prep.....5	CA	105	Fund. of Cloth.....5
EH	101	English Comp.....3	CA	115	Cloth. & Man.....3	EH	103	English Comp.....3
NF	112	Nutr. & Man.....3	EH	102	English Comp.....3	FCD	157	Fam. & Hum. Dev.....3
PE		Physical Education.....1	PE		Physical Education.....1	PE		Physical Education.....1

SOPHOMORE YEAR

EC	200	Econ. I*.....5	EC	202	Econ. II*.....5	PS	200	Fnd. of Physics.....5
SY	201	Intr. to Soc.....5	NF	204	Meal Mgt.....5	FCD	267	Child Dev. I.....4
CA	113	Housing for Man.....3	PG	211	Psychology.....5	FCD	270	Family II.....4
HY	204	Tech. & Civ. I.....3	HY	205	Tech. & Civ. II.....3	HY	206	Tech. & Civ. III.....3
SC	202	App. Speech Comm.....3						

JUNIOR YEAR

CA	233	Home Equip. I.....5	MT	331	Prin. of Mkt.....5	MN	310	Prin. of Mgt.....5
SC	211	Public Speaking.....5	CA	355	Cons. Textiles.....3	MN	241	Business Law I.....4
CA	323	Man the Consumer.....3			Liberal Ed. Elective.....3			Prof. Elective.....4
		Elective.....4			Elective.....3			

SENIOR YEAR

CA	541	Fam. Finance Mgt.....5	CA	530	Cons. Oriented Legis.....5	CA	523	Home Equipment II.....5
		Liberal Ed. Elective.....5	CA	443	Home Mgt. Res.....5	CA	570	Mgt. Problems.....3
		Elective.....5	CA	553	Cons. & the Market.....3			Prof. Electives.....10
		Prof. Elective.....4	CA	431	Man-Environ. Rel.....2			
					Liberal Ed. Elective.....5			

TOTAL—205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

APPROVED PROFESSIONAL ELECTIVES

Choose 18 hours from the following: CA 205, 303, 333, 336, 343, 511, 514; NF 312, 324, 358, 362; FCD 269, 477; ACF 323, EC 340, 360; EM 300; JM 315; MN 344.

Fashion Merchandising (FM)

Fashion Merchandising prepares majors for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion promoter, or a store owner-manager. Ten weeks of retail training is included in the fashion merchandising curriculum.

Curriculum in Fashion Merchandising (FM)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra.....	5	CH 103	Fund. of Chem. I.....	4	CH 104	Fund. of Chem. II.....	4
CA 116	Art for Liv. I.....	3	CH 103L	Gen. Chem. Lab.....	1	CH 104L	Gen. Chem. Lab.....	1
CA 116L	Art for Liv. Lab.....	2	CA 115	Clothing & Man.....	3	EH 103	English Comp.....	3
EH 101	English Comp.....	3	EH 102	English Comp.....	3	FCD 157	Fam. & Human Dev.....	3
	HY/AT*.....	3		HY/AT*.....	3		HY/AT*.....	3
PE	Physical Education.....	1	PE	Physical Education.....	1	NF 112	Nutrition & Man.....	3
						PE	Physical Education.....	1

SOPHOMORE YEAR

CH 203	Org. Chem.....	5	CA 105	Fund. of Clothing.....	5	CA 225	Textiles.....	5
EC 200	Economics I.....	5	EC 202	Economics II.....	5	MT 331	Prin. of Mkt.....	5
PG 211	Psychology.....	5	SY 201	Intr. to Soc.....	5	ACF 211	Prin. of Acc. I.....	4
CA 205	Cloth. Cons. & Sel.....	3	CA 113	Housing for Man.....	3	SC 202	App. Sp. Comm.....	3
EH**	.....	3						

*Students may take any combination of World History, HY 101-102-103; Tech. and Civilization, HY 204-205-206; History of World Art, AT 171-172-173.

**Students may choose one course from English Lit., EH 253, or Sur. Lit. Western World, EH 260-261-262.

JUNIOR YEAR

MT 433	Retail Store Mgt.**.....	5	CA 316	Fash. Analysis.....	5	CA 325	Fashion Merch.....	5
CA 226	Fash. Sketch.....	3	CA 323	Man the Consumer.....	3	MT 432	Promotional Strat.....	5
JM 315	Tech. Journ.....	3	CA 334	Intr. to Fld. Exp.....	2		Prof. Electives*.....	8
	Prof. Electives*.....	8		Electives.....	7			

SENIOR YEAR

CA 335	Retail Training.....	13	CA 516	Apparel Qual. Eval.....	5	CA 525	History of Cost.....	5
			CA 535	Textile Testing.....	5	CA 431	Man-Env. Rel.....	2
				Elective.....	5		Prof. Electives*.....	10

TOTAL—205 QUARTER HOURS

*Professional Electives—8 of the 13 hours selected from among CA 206, 385, 395, 521, 523, 524, 556, 575, 583; ACF 212; MT 436, 437, 440; SY 505; any CA courses. 13 hours from EC 206, 274; MN 241, 242, 310, 346, 442; MT 436, 437, or any justifiable courses.

**A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed for credit from the School of Business.

One-year Transfer Programs

Qualified students in the Clothing, Textile Design, or Fashion Merchandising curricula may apply for one of several one-year transfer programs to be taken during the junior year. Transfer Programs are planned with an adviser so that transfer credits meet Auburn curriculum requirements while the student earns an Associate Degree from the transfer institution.

Programs are available with the Fashion Institute of Technology in New York in clothing and textile design and merchandising. Apparel Engineering is available in cooperation with Southern Technical Institute in Marietta, Ga.

For further information, contact the Head of the Consumer Affairs Department.

One-quarter Internship Programs

Students majoring in Fashion Merchandising or Interior Furnishings and Equipment are required to arrange an internship or field experience away from campus during one quarter of the junior or senior year. However, such experiences can be arranged for students in any Consumer Affairs major. To earn credit, internship site and work-study program must be approved by the student's adviser.

Housing (HS)

Graduates of the program will fill the growing need for professionals such as housing community service director, housing educator, consultant, counselor, public housing manager, or extension worker.

Curriculum in Housing (HS)

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. of Biology	5	BI	104	Bio. in Human Affairs	5	SY	201	Intr. to Soc. or	
MH	160	Pre-Cal. w/Trng.	5	PG	211	Psychology	5	RSY	261	Rural Soc.	5
CA	113	Housing for Man.	3	CA	115	Clothing & Man.	3	CA	116	Art for Living I	2
EH	101	English Comp.	3	EH	102	English Comp.	3	CA	116L	Art for Living Lab.	2
PE		Physical Education	1	NF	112	Nutrition & Man.	3	EH	103	English Comp.	3
								FCD	157	Fam. & Human Dev.	3
								PE		Physical Education	1
SOPHOMORE YEAR											
CA	233	Home Equipment I	5	BSC	202	Materials of Const.	5	EC	200	Economics I**	5
MN	241	Business Law I**	4	CA	303	The House	5	RSY	362	Comm. Org.	5
CA	323	Man the Consumer	3	SY	220	Statistics	5	EH	315	B & P Rept. Writing	3
HY	204	Tech. & Civ. I	3	HY	205	Tech. & Civ. II	3	HY	206	Tech. & Civ. III	3
PE		Physical Education	1					SC	202	Art. Speech Comm.	3
JUNIOR YEAR											
CA	514	Soc. Prob. of Hous.	5	MT	331	Prin. of Mkt.	5	PO	323	Mun. Govt.	5
EC	202	Economics**	5			Math/Nat. Sci.*	5	CA	553	Cons. & the Mkt	3
		Hum/Fine Arts*	5			Prof. Elective	5			Elective	5
CA	431	Man-Environ. Rel.	2			Elective	3			Prof. Elective	5
SENIOR YEAR											
CA	541	Fam. Fin. Mgt.	5	AEC	509	Resource Econ.	5	CA	336	or Prof. Electives	15
SY	505	Urban Sociology	5	CA	530	Cons. Oriented Legis.	5				
		Prof. Elective	5			Electives	6				

TOTAL—205 QUARTER HOURS

^aLiberal Education Electives

**A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from the School of Business.

APPROVED PROFESSIONAL ELECTIVES

An internship (CA 336) may be used in partial fulfillment of professional electives

Minimum of 10 hours selected from: FCD 267, 269, 306, 310, 347; NF 358; SY 202, 204, 309, 310, 311, 370, 375, 501, 508, 520

Minimum of 10 hours selected from: ACF 211, 323; EC 206, 360, 546, 555, 558, 559; MN 242, 310, 346, 367; PO 328.

Minimum of 10 hours selected from: BSC 101, 261-262; AR 360, 370, 474; CA 313, 333, 343, 355, 533; HF 221, IE 308; U 210

Interior Furnishings and Equipment (IFE)

Professional opportunities for graduates in Interior Furnishings and Equipment include designing, merchandising, and consumer consulting positions with retailers, manufacturers, public utilities, cooperative extension, and some government agencies.

Curriculum in Interior Furnishings and Equipment (IFE)

FRESHMAN YEAR									
First Quarter			Second Quarter			Third Quarter			
MH 140	College Algebra	5	CH 103	Fund. of Chemistry I	4	CH 104	Fund. of Chemistry II	4	
CA 116	Art for Living I	3	CH 103L	Gen. Chemistry Lab.	1	CH 104L	Gen. Chemistry Lab.	1	
CA 116L	Art for Living Lab	2	CA 115	Clothing & Man	3	SC 211	Public Speaking	5	
EH 101	English Comp.	3	CA 113	Housing for Man	3	AT*		3	
NE 112	Nutrition & Man	3	EH 102	English Comp.	3	EH 103	English Comp.	3	
PE	Physical Education	1	HY*		3	FCD 157	Fam. & Human Dev.	3	
			PE	Physical Education	1	PE	Physical Education	1	
SOPHOMORE YEAR									
AT 111	Fundamentals	5	EC 202	Economics II	5	BY 105	Microbio & Mod. Man.	5	
CH 203	Organic Chemistry	5	PG 211	Psychology	5	CA 225	Textiles	5	
EC 200	Economics I	5	PS 200	Fnd. of Physics	5	CA 233	Home Equipment I	5	
EH 260	261, or 262 Wild. Lit.	3		Prof. Elective	3		Prof. Elective	3	
JUNIOR YEAR									
CA 313	Home Furnishings	5	CA 303	The House	5	CA 533	Home Equip. II	4	
MT 331	Prin. of Mkt.	5	CA 333	Lighting Design	5	CA 343	Interior Home Prob.	5	
SY 201	Intr. to Soc.	5	EH 415	Writ. Bus. Comm.	3	CA 553	Cons. & the Market	3	
CA 323	Man. the Consumer	3					Prof. Elective		

SENIOR YEAR

First Quarter			Second Quarter			Third Quarter		
CA 431	Man Environ. Rel.	2	CA 336	Field Exp.	5-15	CA 473	Contemp. Home Furn.	3
	Electives	9		Prof. Electives**	0-10		Electives	4
	Prof. Elective	5					Prof. Electives	9

TOTAL—205 QUARTER HOURS

*Students may take any combination of World History: HY 101-102-103; Tech. and Civilization, HY 204-205-206; Art History, AT 171-172-173.

**Students who take a 15 credit field experience, take the reduced number of professional electives.

APPROVED PROFESSIONAL ELECTIVES

Minimum of 10 hours selected from: ACF 211, 323; CA 325, 514, 530, 535, 541, 583; MN 241, 242, 310, 346; MT 341 432, 433, EC 555; SY 311; JM 315; NF 104; EH 315.

Minimum of 10 hours selected from: BSC 202; AR 360, 370; AT 112, 371, 379 ID 365, 366, 367; U 210, CA 216, 375, 385, 515, 575, 586; HF 221.

Department of Family and Child Development

The Department of Family and Child Development is concerned with the processes of growth and development of the individual in his daily living from infancy to old age and with the creation of techniques for facilitating such development. Its primary mission is the promotion of self-fulfillment of individuals and families through maximum utilization of material and human resources.

Two curricula, including three majors, are offered in this department: Family and Child Development (General Family and Child Development, Day Care and Programs for Young Children) and Family and Child Services.

Family and Child Development (FCD)

The major in Family and Child Development prepares students for professional work with families and individuals of all age levels, with challenging careers in programs for young children and youth, family life education, and business.

Curriculum in Family and Child Development (FCD)

Major in General Family and Child Development

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Pnn. of Biology	5	BI 104	Bio. Hum. Affairs	5	SY 201	Intr. to Sociology	5
EH 101	Eng. Comp.	3	PG 211	Psychology	5	EH 103	Eng. Comp.	3
HY *		3	EH 102	Eng. Comp.	3	FCD 157	Fam. & Human Dev.	3
PE	Physical Education	1	HY *		3	NF 112	Nutr. & Man.	3
			PE	Physical Education	1	HY *		3
						PE	Physical Education	1

SOPHOMORE YEAR

FCD 267	Child Dev. I	4	MH or PA (approved)	5	EC 200	Economics I	5	
CA 115	Clothing & Man	3	SC 273	Gr. Prob. Solving	5	FCD 301	Child Dev. II	4
	Electives	10	FCD 269	Family I	4	CA 116	Art for Living I	3
			CA 113	Housing for Man	3		Electives	5

JUNIOR YEAR

FCD 300	Appr. Child Study	5	FCD 302	Child Dev. III	4	CA 323	Man the Consumer	3
FCD 270	Family II	4	FCD 306	Family III	4		Prof. Electives	15
	Liberal Ed. Elect.	5		Electives	8			
	Prof. Electives	5						

SENIOR YEAR

Prof. Electives	13	FCD 420	Rec. Res. Child Dev.	4	Electives	11
Liberal Ed. Elective	5	CA 431	Man-Env. Rel.	2	Prof. Electives	7
			Liberal Ed. Elect.	5		
			Prof. Elect.	7		

TOTAL—205 QUARTER HOURS

Major in Day Care and Programs for Young Children

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. of Biology	5	PG 211	Psychology	5	SY 201	Intr. to Soc.	5
MH or	PA (approved)	5	ZY 105	Intr. Hum. Physiol.	5	EH 103	Eng. Comp.	3
EH 101	Eng. Comp.	3	EH 102	English Comp.	3	FCD 157	Fam. & Human Dev.	3
HY *			HY *			HY *		
PE	Physical Education	1	PE	Physical Education	1	NF 112	Nutrition & Man	3
						PE	Physical Education	1

SOPHOMORE YEAR

FCD 267	Child Dev. I	4	SC 273	Gr. Prob. Solving	5	EC 200	Economics I	5
CA 115	Cloth. & Man.	3	FCD 269	Family I	4	FCD 301	Child Dev. II	4
CA 113	Hous. for Man.	3	CA 116	Art for Living I	3		Prof. Elective	5
	Lib. Ed. Electives	5		Prof. Elective	3			
	Elective	3						

JUNIOR YEAR

FCD 300	Appr. Child Study	5	FCD 302	Child Dev. III	4	FCD 358	Learn. Exp. Child	4
FCD 270	Family II	4	FCD 306	Family III	4	FCD 467	Parent Ed.	4
FCD 350	Intr. to Day Care	3	FCD 351	Dev. Day Care Prog.	3	CA 323	Man the Consumer	3
	Prof. Elective	5	FCD 347	Lab. Exp. Child	2	NF 312	Child Nutrition	3
				Prof. Elective	4		Prof. Elective	5

SENIOR YEAR

FCD 359	Learn. Exp. Child. Lab	4	FCD 420	Rec. Res. Child Dev.	4	FCD 497D	Dir. Field Exp:	
FCD 471	Admin. Prog. Child	3	CA 431	Man-Environ. Rel.	2		Day Care	5-15
	Liberal Ed. Elective	5		Liberal Ed. Elective	5		Prof. Electives	3-13
	Prof. Electives	3		Prof. Electives	6			
	Elective	3						

TOTAL—205 QUARTER HOURS

*Students may take any combination of World History, HY 101-102-103; Technology and Civilization, HY 204-205-206; History of Art, AT 171-172-173; or Western World Literature, EH 260-261-262.

Family and Child Services (FCS)

Family and Child Services is a broadly-based curriculum designed to provide students with the relevant knowledge and motivation to enter employment in human service occupations and professions not requiring graduate education immediately upon receiving their bachelor's degree. The curriculum also is sound preparation for the student planning to enter graduate study.

Curriculum in Family and Child Services (FCS)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. of Bio.	5	BI 104	Bio. Hum. Affairs	5	SY 201	Intr. to Soc.	5
EH 101	English Comp.	3	PG 211	Psychology I	5	EH 103	English Comp.	3
HY *			CA 113	Housing for Man	3	FCD 157	Fam. & Human Dev.	3
NF 112	Nutrition & Man	3	EH 102	English Comp.	3	HY *		
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

MH or	PA (Appr.)	5	EC 200	Economics I	5	PO 210	Amer. State/Local Govt.	5
FCD 267	Child Dev. I	4	PG 215	Quant. Methods	5	SC 273	Group Prob. Solv.	5
CA 115	Cloth. & Man.	3	FCD 269	Family I	4	FCD 301	Child Dev. II	4
	Liberal Ed. Elect.	5	CA 116	Art for Living I	3		Elective	3

JUNIOR YEAR

FCD 300	App. Child Study	5	FCD 302	Child Dev. III	4	SW 375	Int. Soc. Work	5
PO 325	Pub. Administration	5	FCD 308	Fam. Ch. Men. HI	4	SY 308	Juv. Del.	5
FCD 270	Family II	4	CA 323	Man the Consumer	3	FCD 306	Family III	4
PG 330	Soc. Psychology	4		Prof. Electives	6		Elective	5

			SENIOR YEAR				
First Quarter			Second Quarter		Third Quarter		
FCD 420	Rec. Res. Child Dev.	4	FCD 497A	Dir. Field Exp.	RSY 362	Comm. Org.	5
FCD 310	Tech. of Inter.	4		Social Services	5-15	Elective	5
CA 431	Man-Environ. Rel.	2		Prof. Electives	10	Liberal Ed. Elective	5
FCD 487	Intr. to Field Exp.	2					
	Elective	4					
	Prof. Elective	4					

TOTAL—205 QUARTER HOURS

*Students may take any combination of World History, HY 101-102-103; Technology and Civilization, HY 204-205-206; History of Art, AT 171-172-173; or Western World Literature, EH 260-261-262.

Internship Program

Students enrolled in all curricula within the department may apply for a directed field experience in their area of specialization. Application is to be made four quarters in advance of the term in which the internship is desired. Certain prerequisites are to be satisfied before an internship is approved, and students are encouraged to select their professional and free electives carefully to insure that prerequisites are fulfilled. Normally, an internship may be taken for a minimum of 10 and a maximum of 15 credits. Information and application materials are available in the departmental office.

The department operates the Child Study and Family Life Center for training and research. Children are admitted to the Child Study Center educational program according to the special study needs of students and faculty. A tuition fee is charged.

Department of Nutrition and Foods

The Nutrition and Foods major is designed for students having a strong interest in the health, physical growth, and welfare of people, and the ability to apply scientific principles to the solution of problems. The sociological, psychological, physiological, and economic aspects of food in nutritional status are integral parts of the program.

The department, through its majors in Coordinated Dietetics, Nutrition and Foods, and Food Service Administration, prepares students for teaching, research, and health service careers in educational institutions, hospitals, industry, and government.

Food Service Administration (FSA)

The Food Service Administration major prepares students to manage food service operations.

Curriculum in Food Service Administration (FSA)

FRESHMAN YEAR									
First Quarter			Second Quarter				Third Quarter		
MH 140	College Algebra or		NF 104	Prin. of Food Prep.	5	NF 204	Meal Mgt.	5	
MH 160	Pre-Cal. w/Trig.	5	CH 103	Fund. of Chem. I	4	CH 104	Fund. of Chem. II	4	
EH 101	English Comp.	3	CH 103L	Gen. Chemistry Lab.	1	CH 104L	Gen. Chemistry Lab.	1	
HY 101	World History*	3	EH 102	English Comp.	3	EH 103	English Comp.	3	
NF 112	Nutrition & Man	3	HY 102	World History*	3	HY 103	World History*	3	
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1	

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
CH 203	Organic Chemistry	5	BI 101	Prin. of Biology	5	EC 202	Economics II***	5
PG 211	Psychology	5	EC 200	Economics I***	5	SC 211	Fund. Speech Comm.	5
ACF 211	Prin. of Acc. I***	4	SY 201	Intr. of Soc.	5	ZY 105	Intr. Human Physiology	5
EH	Literature Elective	3	EH 304	Tech. Writing or			Elective	3
			JM 315	Tech. Journalism	3			
JUNIOR YEAR			SENIOR YEAR					
MN 310	Prin. of Mgt.	5	BY 300	Intr. to Microbiol. or		EC 350	Labor Economics***	5
NF 564	Experimental Foods	5	BY 300	Gen. Microbio.	5	MT 331	Prin. of Mkt.	5
	Prof. Electives**	5	MN 241	Business Law I***	4		Prof. Elective**	5
	Elective	3	ADS 415	Food Plant San.	3		Elective	3
				Prof. Elective**	5			
MT 432	Promot. Strategy	5	MT 437	Sales Mgt.	5	NF 346	Food Ser. Org. & Mgt.	5
NF 404	Quant. Food Prep.	5	VED 513	Nature of Adult Ed.	4		Elective	10
CA 431	Man-Environ. Relat.	2		Prof. Elective**	5			
	Prof. Elective**	5		Elective	4			

TOTAL—205 QUARTER HOURS

*Any combination of World History, HY 101-102-103; Technology and Civilization: HY 204-205-206; History of Art: AT 171-172-173; or Western World Literature, EH 260-261-262, may be taken.

**To qualify for ADA membership through therapeutic and administrative dietetics, students will be required to take the courses marked ** or the list of suggested professional electives.

***A maximum of 51 credit hours, excluding EC 200, 203, and ACF 340, is allowed from School of Business.

Nutrition and Foods (NF)

Major areas of concentration in Nutrition and Foods include dietetics, nutrition, and experimental foods with minors in food science, teaching, chemistry, biology, journalism, radio and television and others from which a student may select.

Curriculum in Nutrition and Foods (NF)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra or		NF 104	Prin. of Food Prep.	5	CH 104	Fund. of Chem. II	4
MH 160	Pre-Cal. W/Trig.	5	CH 103	Fund. of Chem. I	4	CH 104L	Gen. Chem. Lab.	1
BI 101	Prin. of Biology	5	CH 103L	Gen. Chem. Lab.	1	CA 115	Clothing & Man	3
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
PE	Physical Education	1	PE	Physical Education	1	NF 112	Nutrition & Man	3
						PE	Physical Education	1

SOPHOMORE YEAR

CH 203	Organic Chem	5	EC 200	Economics I*	5	FED 214	Psy. Fnds. of Ed.	5
NF 204	Meal Mgt.	5	PG 211	Psychology	5	ZY 105	Intr. Human Physiology	5
SY 201	Intr. to Soc.	5	PS 200	Fnds. of Physics	5	CA 116	Art for Liv. I	3
CA 113	Housing for Man	3		Lit. Electives	3	FCD 157	Family & Hum. Dev.	3

JUNIOR YEAR

NF 564	Experimental Foods	5	BY 300	Gen. Microbio.	5	NF 346	Food Service Org. & Mgt.	5
NF 318	Nutri. Biochem.	5	NF 382	Prin. of Normal Nutrition I	5	NF 392	Prin. of Normal Nutrition II	5
CA 323	Man the Consumer	3	SY 220	Statistics or		SC 202	App. Speech Comm.	3
	Prof. Elective*	5	BY 501	Biol. Stat.	5		Prof. Elective*	3
				Prof. Elective*	3			

SENIOR YEAR

NF 404	Quant. Food Prep.	5	EH 301	Creative Writing or		CA 431	Man-Environ. Rel.	2
	Prof. Electives*	8	EH 304	Tech. Writing or			Prof. Electives*	8
	Elective	3	JM 315	Tech. Journalism	3		Elective	5
				Prof. Electives*	6			
				Electives	9			

TOTAL—205 QUARTER HOURS

*A maximum of 51 credit hours, excluding EC 200, 202, and ACF 340, is allowed from School of Business.

Special areas of interest in Nutrition, Dietetics, Food Science, Communication in Food & Nutrition, Research, and Teacher Education may be developed through choice of elective courses.

NUTRITION AND FOODS OPTIONS—PROFESSIONAL ELECTIVES

A. General Dietetics		C. Management		
ANT 203	Intr. Anthro*	ACF 211, 212	Accounting.....4, 4	
IE 480	Data Proc. Fund.	EC 202	Economics II*	5
NF 502	Diet Therapy*	EC 350	Labor Econ.*	5
NF 408	Independent Study.....3-8	MN 310	Prin. Mgt.	5
B. Community Nutrition		MN 442	Personnel Mgt.	5
ANT 203	Intr. Anthro*	IE 480	Data Proc. Fund.	5
NF 358	Comm. & Fam. Health*	NF 408	Independent Study.....3-8	
NF 502	Diet Therapy.....5	D. Therapeutic & Clinical Dietetics		
NF 408	Independent Study.....3-8	ANT 203	Intr. Anthro*	5
NF 362	Prob. Comm. Nutr.*	ZY 424	An. Physiol.*	5
MN 310	Prin. Mgt.	NF 502	Diet Therapy*	5
		NF 408	Independent Study.....3-8	

*ADA Requirements

Coordinated Dietetics Program (CDP)

Upon completion of this program incorporating clinical experiences with classroom teaching, the student is eligible for Registration as a Dietitian by the American Dietetic Association.

Curriculum in the Coordinated Dietetics Program (CDP)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 140	College Algebra or	NF 104	Prin. of Food Prep.....5	CH 104	Fund. of Chem. I.....4
MH 160	Pre-Cal. w/Trig.....5	CH 103	Fund. of Chem. I.....4	CH 104L	Gen. Chem. Lab.....1
CA 113	Housing for Man.....3	CH 103L	Gen. Chem. Lab.....1	CA 116	Art for Living I.....3
EH 101	English Comp.....3	EH 102	English Comp.....3	CA 115	Clothing & Man.....3
HY 101	World History*.....3	HY 102	World History*.....3	EH 103	English Comp.....3
NF 112	Nutrition & Man.....3	PE 102	Physical Education.....1	HY 103	World History*.....3
PE 102	Physical Education.....1			PE 102	Physical Education.....1

SOPHOMORE YEAR

BI 101	Prin. of Biol.....5	BI 103	Animal Biol.....5	PG 211	Psychology.....5
CH 203	Organic Chem.....5	BY 300	Gen. Microbiology.....5	SY 201	Intr. to Soc.....5
NF 204	Meal Mgt.....5	EC 200	Economics I.....5	ZY 251	Physiology.....5
FCD 157	Family & Human Dev.....3	EH 102	Lif. Elective.....3		Elective.....3

JUNIOR YEAR

NF 564	Experimental Foods.....5	NF 516	Quant. Food Prep.....10	NF 356	Food Ser. Admin.....10
NF 318	Nutr. Biochem.....5	NF 382	Prin. of Normal Nutrition I.....5	NF 392	Prin. of Normal Nutrition II.....5
CA 323	Man the Consumer.....3			VED 466	Tch. Out-of-School Groups.....3
NF 307	Suv. of Dietetics.....2				

SENIOR YEAR

NF 522	Comm. Nutrition.....10	NF 432	Med. Dietetics.....10	NF 442	Advanced Dietetics.....15
NF 592	Nutr. in Life cycle.....5	CA 431	Man-Environ. Rel. Elective.....5		
	Elective.....3				

TOTAL—205 QUARTER HOURS

*HY 204-205-206 Tech. & Civil; EH 260-261-262, Western World Literature; or AT 171-172-173, History of Art may be substituted for HY 101-102-103

Dual Objective Program with the School of Education

Dual objective programs with the School of Education (see p. 134) are open to students registered in the School of Home Economics in the following five majors:

Family and Child Development
Clothing, Textiles and Related Art
Nutrition and Foods

Family Resource Management
Family Economics
Interior Furnishings and Equipment
Housing

Option in Cooperative Extension

Students enrolled in any of the majors in the School may prepare for a career in the Cooperative Extension Service through selection of certain courses as electives. The major of Family Resource Management meets the requirements of this option. Other majors may also fulfill the requirements of the Cooperative Extension Service through scheduling of the following courses:

NF-104, 112, 204, 324, 362
CA-105, 233, 323, 343, 225 or 355, 541, 553
FCD-267, 467

GRADUATE WORK

The School offers work leading to the Master of Science degree, Master of Arts in College Teaching degree, and the Ph.D. degree in Experimental Nutrition, an interdepartmental program.





School of Nursing

MARY F. WOODY, *Dean*

THE SCHOOL OF NURSING, established in 1978-79, offers programs of preparation for students planning to enter nursing and additional health-related professions. A two year pre-professional program in nursing science is required of all students seeking admission to the professional curriculum. Admissions criteria and the basic curriculum, with options, for the two upper division professional years will not be available prior to publication of the 1979 *Auburn University Bulletin*.

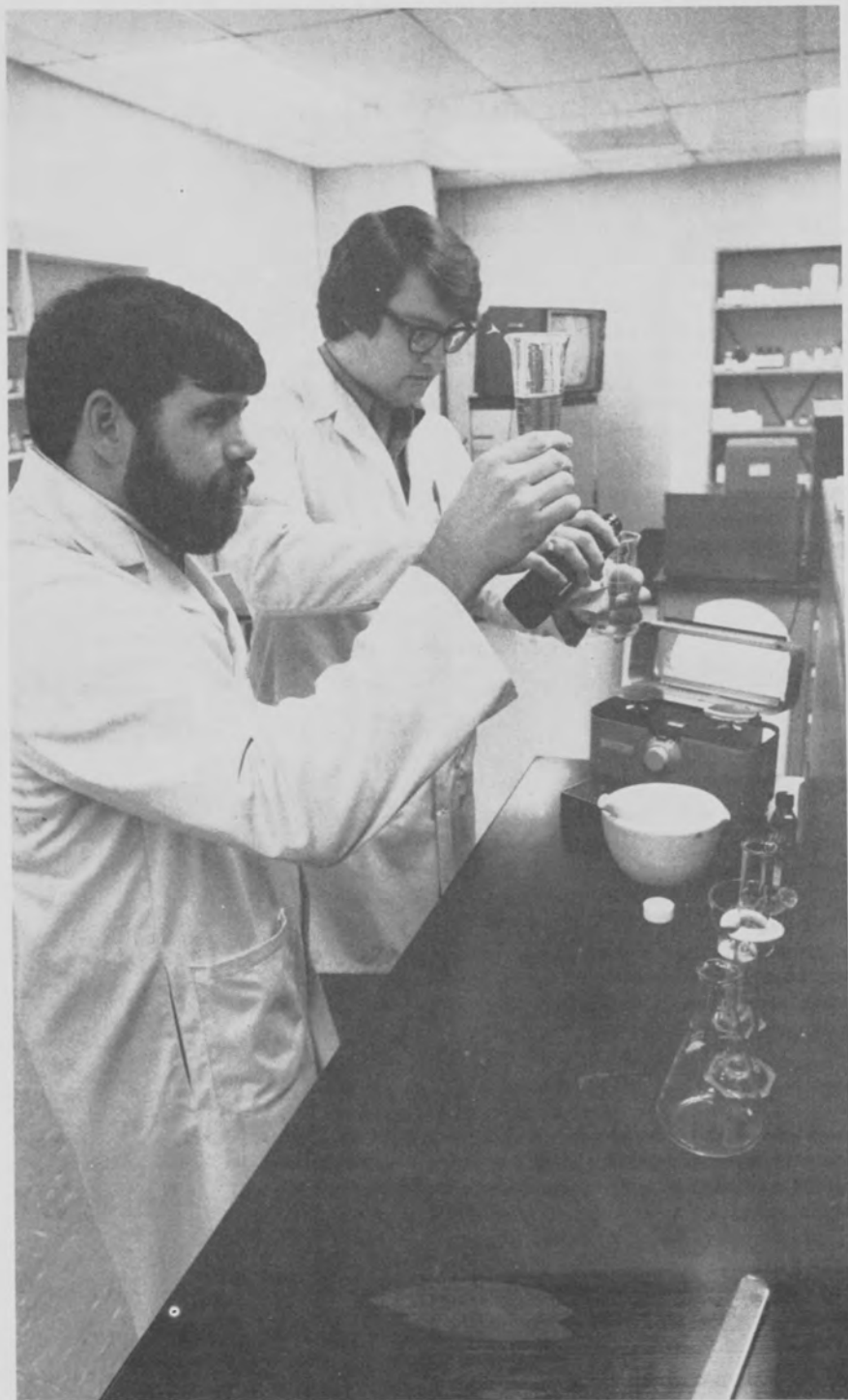
Curriculum in Pre-Nursing Science (NS)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
MH 140	College Algebra or	BI 101	Prin. of Biology5	CH 203	Organic Chemistry5
MH 160	Pre-Cal. w/Trig.5	CH 104	Fund. of Chem. II4	PG 211	Psychology5
CH 103	Fund. of Chem. I4	CH 104L	Gen. Chemistry Lab . . .1	EH 103	English Comp.3
CH 103L	Gen. Chemistry Lab. . .1	EH 102	English Comp.3	HY 103	World History3
EH 101	English Comp.3	HY 102	World History3	PE	Physical Education . . .1
HY 101	World History3	PE	Physical Education . . .1		
PE	Physical Education . . .1				

SOPHOMORE YEAR

First Quarter		Second Quarter		Third Quarter	
NF 318	Nutri. Biochem.5	ANT 203	Intr. to Ant.5	BY 300	Gen. Microbiol.5
SY 201	Intr. to Soc.5	ZY 251	Physiology5	PG 330	Social-Psy.4
ZY 250	Anatomy5		Literature Elective . . .3	NF 372	Fund. of Nutrition . . .3
	Elective3		Elective5		Elective5



School of Pharmacy

BEN F. COOPER, *Dean*

THE SCHOOL OF PHARMACY offers a fully accredited program leading to the degree of Bachelor of Science in Pharmacy. The curriculum requires three years in the professional school after completion of two years in the pre-professional program.

The undergraduate degree in pharmacy is a necessary requisite for licensure for the practice of pharmacy in each of the 50 states and also the territories of the United States. In addition, completion of the program prepares students for careers in those areas of pharmacy not requiring licensure.

Pharmacists provide those personal health services that assure safety and efficacy in the procuring, storing, prescribing, compounding, dispensing, delivering, administering, and use of drugs and related articles. Among these services are maintenance of patient medication profiles, monitoring of drug therapy, counseling patients in matters of health, and providing health and drug information for nurses, physicians, and other health care practitioners.

Opportunities for graduates exist in community pharmacy, institutional pharmacy, industrial pharmacy (research, product development, analytical control, product manufacture, sales, and distribution), wholesale pharmacy, public health, health care funding agencies, and regulatory agencies. In addition, there are opportunities in research and teaching in an academic environment, after further education.

Admissions

The course requirements for admission to the School of Pharmacy may be satisfied by completion of the six quarter prepharmacy curriculum as outlined on page 99. Any or all of these requirements may be met by transfer of credit from other institutions. Transfer students from junior colleges may receive no more than 98 quarter hours credit for the prepharmacy curriculum.

Admission is limited and is contingent upon available facilities and faculty. To be considered for admission the applicant must have a satisfactory grade point average based on all courses attempted as well as a satisfactory science index (grade point average on the biological and physical science courses). A grade of D on any required course will not be accepted.

Students are accepted into the School of Pharmacy twice annually, Fall and Spring. Spring Quarter applications for the admission to the School of Pharmacy should be submitted not later than October 1, while Fall Quarter applications should be submitted not later than March 1. To be considered for admission to the School of Pharmacy, the applicant must forward to the Pharmacy Admission Committee a completed application, a photograph, two interview report forms, two letters of recommendation, Pharmacy College Admissions Test scores (PCAT should be taken in November for Spring Admission and in February for Fall Admission), and complete transcripts of all work attempted, along with a list of courses in progress and courses

planned before entrance into the pharmacy curriculum. Applicants must appear for a personal interview with the Pharmacy Admission Committee upon request. Applicants will be notified as to acceptance or rejection no later than February 15, for Spring Admission and July 15, for Fall Admission.

If an applicant has not previously attended Auburn University, he/she must also be accepted by the Admissions Office before his/her application to the School of Pharmacy can be considered. For University applications write Admissions Office, Auburn University, Auburn, Alabama, 36830.

Any student in the pharmacy curriculum who is subjected to academic suspension and desires to re-enter the School of Pharmacy must, in addition to complying with the pertinent University regulation, be approved by the Pharmacy Admission Committee for re-admission.

Waiver of Nine Quarter Residency Requirement

Attention is called to the following regulation of the American Association of Colleges of Pharmacy: "Each member college shall require of each candidate for a degree in pharmacy completion of not less than five full academic years of training including both prepharmacy instruction and a minimum of three years of professional instruction," with the exception that waiver (of usually one quarter) of the three years of professional instruction requirement may be granted provided there has been proper sequencing of professional courses, adherence to stated course prerequisites, and demonstrated scholarship. In addition, other "appropriate factors" shall be considered in arriving at the decision of whether to grant the waiver.

To be allowed to pursue an eight quarter program for graduation, a student must have eighteen hours of advanced credit in the professional curriculum and a grade point average of at least 2.75 when accepted to the School of Pharmacy. If a student maintains a grade point average of at least 2.75 during the first two quarters of the professional curriculum, the Director of Curriculum will submit the student's eight quarter program to the Pharmacy Faculty for their approval of waiver of the nine quarter residency requirement. This action shall take place during the first half of the student's third quarter.

Guidelines to Academic Performance for Pharmacy Students

1. Grade point averages will be calculated from professional coursework only. *Professional coursework* is defined as those required and elective courses listed in the "Curriculum in Pharmacy" published in the current *Auburn University Bulletin*.
2. If an entering student does not maintain a GPA cumulative record of 2.0 for the 54 hours required in the first professional year, he or she will be required to retake all "D" and "F" graded courses and will be denied entrance into 04PY courses until the 2.0 GPA is attained. In addition, students must maintain a 2.0 GPA in 04PY courses in order to be eligible to register for PY459.

3. Upon receiving two failing grades ("F" or where appropriate "U") within a period of five consecutive enrollment quarters, whether the grades are received from the initial grade on a course, or from the retake of a previously failed course, the student will be suspended from the School of Pharmacy for two quarters. The student may appeal the suspension to the Professional and Academic Standards Committee of the School of Pharmacy in the event that significant extenuating circumstances exist.
4. Upon reinstatement from the first suspension, two additional "F" grades will result in a second suspension from the School of Pharmacy.
5. If a student is twice suspended, he or she may not re-enter the School of Pharmacy.
6. A student must receive passing credit in at least 12 hours of professional courses to receive one quarter of residency credit. A student receiving passing credit for 6-11 hours in professional courses will receive one-half quarter of residency credit.
7. A student must observe prerequisites and corequisites as stated in the current *AU Bulletin*.
8. All guidelines will be implemented in addition to University policies and standards existing.
9. A student desiring to retake a previously failed Pharmacy course must obtain consent of the appropriate Pharmacy School Department Head in order to retake the course.
10. A student may not add a course in the School of Pharmacy after five academic class days.
11. If a student drops a professional elective course after five academic class days, he or she will not be allowed to retake the course.

Curriculum Options

After the completion of the second professional year, students may choose a curriculum option which provides specialized knowledge in the areas of community pharmacy, institutional pharmacy, or graduate studies. Faculty advisers will provide guidance in the selection of curriculum options and the selection of appropriate courses of instruction within these options. Each of the options will adequately prepare students for licensure examinations.

Licensure Requirements

The Alabama State Board of Pharmacy (BOARD) controls (ACT205) the practice of pharmacy in the state. In brief the requirements for licensure are:

1. B.S. in Pharmacy degree from an accredited School of Pharmacy;
2. A total of 1,500 hours of practical experience under the supervision of a registered preceptor, 400 hours of which must be completed after graduation. A maximum of 400 hours of the 1,100 hours which can be earned prior to graduation may be completed while concurrently enrolled in pharmacy school.
3. Students are eligible to and should file an application with the BOARD for registration as an extern/intern at the time they enroll in the School of Pharmacy. Periods of any work experience should be reported to the Secretary of the Board within 10 days of beginning and within 10 days after ending the experience, or at intervals of 16 weeks, whichever first occurs.

4. Graduates of Schools of Pharmacy are eligible to take the theoretical portion of the BOARD examination anytime after graduation and are eligible to take the practical portion upon completion of the extern/intern requirements. Applications for taking the BOARD examinations may be picked up at the Office of the Dean anytime after graduation.
5. The Office of the Dean of the School of Pharmacy will be glad to respond to questions on licensure. Alternatively, request for information can be referred directly to: Mr. J. W. McLane, Secretary, Alabama State Board of Pharmacy, 427 City Federal Building, Birmingham, Ala. 35203.

Continuing Education and Extension Services

Continuing education and extension service programs are available to pharmacists throughout the year. Faculty members of the School of Pharmacy, as well as practicing pharmacists and industry leaders, and consultants in state and federal governmental agencies, serve as instructors.

The Alabama Board of Pharmacy has adopted a regulation, effective January 1, 1978, which requires 10 clock hours of approved continuing education as a requirement for renewal of each pharmacist's controlled substances permit.

Curriculum In Pharmacy (PY)

FIRST PROFESSIONAL YEAR

First Quarter			Second Quarter			Third Quarter		
ZY 560	Mam. Physiol. I	5	ZY 561	Mam. Physiol. II	5	PC 347	Human Pathology	5
CH 301	Biochemistry I	5	CH 302	Biochemistry II	5	BY 302	Med. Microbiol.	5
PY 301	Pharmaceutics I	5	PY 302	Pharmaceutics II	5	PY 303	Pharmaceutics III	5
	Elective	3	PY 316	Mod. Methods of Drug Analysis	3	PC 346	Clin. Eval. Drug Therapy	3

SECOND PROFESSIONAL YEAR

PY 420	Med. Chem. I	5	PY 421	Med. Chem. II	4	PY 422	Med. Chem. III	5
PY 531	Pharmacology I	5	PY 532	Pharmacology II	5	PY 533	Pharmacology III	4
PCS 467	Drug Lit. & Stat.	3	PC 447	Therapy of Disease I	3	PC 448	Therapy of Disease II	3
MN 310	Prin. Management	5	MN 207	Electr. Data Process	2	PCS 464	Pharm. Jurisprudence	5
			PY 432	Chem. Pharmacol. Lab 1 Prof. Elective	3	PY 433	Chem. Pharmacol. Lab 1	

THIRD PROFESSIONAL YEAR

Elective & Option			Elective & Option			Elective & Option		
PY 360	Pharm. Convocation	0	PY 360	Pharm. Convocation	0	PY 360	Pharm. Convocation	0
PCS 562	Med. Info. Systems	3	PC 459	Practice Externship	17	PC 459	Practice Externship	17

TOTAL—159 QUARTER HOURS

NOTES: 1. Proficiency in typing is required for completion of PY 301.

2. Students must participate in field trips to a pharmaceutical manufacturing plant during their junior or senior year, and to a wholesale drug company during their senior year.

3. A set of Class C metric and Apothecaries' weights, which may be purchased from Pharmacy Supply, is required for all Pharmacy laboratories.

4. Students will be required to spend one quarter of their third professional year in an off-campus, structured, externship experience.

5. Students enrolled in clinical or externship courses are required to furnish personal professional liability insurance.

6. All pharmacy elective courses are acceptable for option credit. Director of Undergraduate Study will provide information on any non-pharmacy elective courses which are acceptable.

7. Students who are qualified and have the prerequisites may take up to 10 hours of graduate courses in their fifth year; however, such work cannot be applied toward both undergraduate and graduate degrees.

School of Veterinary Medicine

J. THOMAS VAUGHAN, *Dean*

NELSON KING, *Associate Dean*

H. C. MORGAN, *Assistant Dean*

THE SCHOOL OF VETERINARY MEDICINE offers a fully accredited program of training leading to the degree of Doctor of Veterinary Medicine. The curriculum requires four years in the professional school after completion of a pre-professional course curriculum which now takes more than four years for the average applicant.

Admissions

A minimum grade-point average of 2.50 on a 4.00 system on all attempted and on all required courses are essential for admission. A grade of D on any required course will not be accepted. In addition, the Committee on Admissions and Standards of the School of Veterinary Medicine may require a personal interview, a reading comprehension test, or an examination on any required course. The School of Arts and Sciences and the School of Agriculture offer Pre-Veterinary curricula which are available only to residents of Alabama. Although farm experience and work with veterinarians are not requirements for admission, applicants are urged to gain such training. Students without this experience frequently have difficulty with certain courses, particularly in the clinical areas.

Application for admission to either pre-veterinary curriculum should be made directly to the Admissions Office, Auburn University. Counseling of pre-veterinary students is the responsibility of the School of Arts and Sciences except for the program in the School of Agriculture.

Minimum Requirements for Pre-Veterinary Medicine

1. COMPLETION OF THE LIBERAL EDUCATION PROGRAM as stated on page 12 of this bulletin.

2. SPECIFIC COURSE REQUIREMENTS: Minimum pre-veterinary requirements for Alabama residents are exactly as listed for the pre-veterinary curriculum on page 100. The program in the School of Agriculture has the same courses, but they are distributed over nine quarters. Applicants from states participating under the Southern Regional Education Board (SREB) must have acceptable equivalents which have been approved by the appropriate state advisers. Individuals taking the pre-veterinary curriculum are expected to declare an academic major prior to their 7th quarter of enrollment.

3. ALL TRANSFER COURSES must be equivalent in hours and content. CLEP substitutions are acceptable as stated in this catalog but only for mathematics and English. Courses will not be waived on the basis of degrees or "practical

experience. Pass-Fail or Satisfactory-Unsatisfactory grades are not acceptable in required courses. Consideration will not be extended to anyone with an overall or required course grade point average of less than 2.50 at the time of application.

4. **TIME LIMITATION:** All required courses in the advanced physical and biological science categories must have been completed within six calendar years prior to the anticipated date of enrollment in the School of Veterinary Medicine.

5. **AGE:** The Committee sets no age limit on entering students, but priority decreases in relation to the diminishing number of productive years following graduation. The preferred age for applicants is 20-28 years. Only in exceptional circumstances will applicants older than 30 years be considered for admission.

Application Procedure

Admission of Alabama residents to the School of Veterinary Medicine must be gained through formal application made between September 15 and October 15 preceding the Fall Quarter in which admission is desired. The length of residence of Alabama applicants shall be a factor. Residents of other states should consult their advisers for exact application dates.

Applicants should submit the following:

1. Two completed application for-admission forms* supplied by the School of Veterinary Medicine.
2. Two official transcripts* from each college or university attended.
3. A list of courses in progress at time of application, if any.
4. Application fee—\$10.00 (not applicable if previously enrolled at Auburn University).

If a student is admitted to the School of Veterinary Medicine, he must submit one completed physical examination report on a form supplied by Auburn University at least three weeks prior to date of registration (not required by students formerly enrolled at Auburn University) and two supplemental official transcripts of any work completed after application is filed.

The final selection of students is made by the Committee on Admissions and Standards of the School of Veterinary Medicine, Auburn University. These selections are made from the applicants who have been certified by the committees in the respective states after giving due consideration to scholastic record and general adaptability for the profession. The right is reserved to accept or reject any applicant. All applications for admission must be on file at the School of Veterinary Medicine by October 15 preceding date of admission.

MICROSCOPES—In order to be admitted to the School of Veterinary Medicine, a student must own a compound microscope acceptable to the faculty. The student must furnish a microscope in all courses requiring the use of this instrument.

ADMISSION UNDER THE REGIONAL PLAN—Under the Regional Plan for Veterinary Training, the School of Veterinary Medicine serves four states: Alabama, Kentucky, North Carolina, and Virginia.

*Only one is required of students formerly enrolled at Auburn University.

The Land-Grant institution in each state participating under the Southern Regional Education plan maintains counseling and guidance service for students desiring admission to the School of Veterinary Medicine. Students attending other institutions should contact the Land-Grant School advisers in their state for information concerning admission requirements.

Scholastic Requirements

All applicants and students in the professional program are subject to the academic and disciplinary regulations of the School of Veterinary Medicine in addition to those of Auburn University.

Any student who earns less than a 2.25 grade-point average for any quarter will be placed on academic probation. A student who fails to earn a 2.25 grade-point average for any two quarters in the same academic or calendar year may be dropped from the rolls of the School of Veterinary Medicine for scholastic deficiency. In addition, a student who does not have an overall average of 2.25 for an academic year or who does not have a veterinary school cumulative average of 2.25 at the end of any academic year may be required to withdraw from the School of Veterinary Medicine.

A student who makes a grade of F on any course may be required to withdraw from the School of Veterinary Medicine until such time as the course is offered again. Such student may be required to repeat certain other courses in the curriculum for that quarter.

Clinical courses are unique in that the art and skills to be developed in them can only be acquired by full participation in the laboratories. The attendance in these courses is required except in case of illness or other extenuating circumstances as may be judged by the involved instructor. The grading in these clinical laboratory courses is primarily by subjective evaluation. When a course involves student rotation through several disciplines or sections, the student must receive a passing grade in each area before a passing grade can be given for the course.

The responsibility for counseling is shared by the Faculty of this School and the University Counseling Service.

Required Withdrawal

The faculty of the School of Veterinary Medicine reserves the right to require the withdrawal at any time of any student who in the judgment of the admissions and standards committee is not profiting from the instruction offered, who is neglectful, irregular or indifferent in the performance of required duties and studies, or whose character or conduct is inconsistent with good order of the veterinary school or with the standard of the veterinary profession.

Requirements for Graduation

To be eligible for the D.V.M. degree, candidates must complete all of the required courses in the order listed in the curriculum in veterinary medicine with a minimum overall grade-point average of 2.25. Following completion of all academic work, each student will be required to serve a preceptorship of

one quarter with a reputable practicing veterinarian. A certificate of satisfactory completion of a preceptorship will be required for graduation.

A graduation fee of \$10.00 must be paid at the beginning of the quarter of graduation and all indebtedness due the institution must be paid prior to graduation.

Curriculum in Veterinary Medicine (VM)

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
VM 320	Anatomy I.....5	VM 321	Anatomy II.....5	VM 322	Anatomy III.....5
VM 326	Micro. Anat. I.....5	VM 327	Micro. Anat. II.....5	VM 328	Micro. Anat. III.....4
VM 313	Physiology I.....4	VM 315	Physiology III.....2	VM 318	Physiology VI.....4
VM 314	Physiology II.....2	VM 316	Physiology IV.....2	VM 331	Vet. Micro. I.....4
VM 300	Orientation.....2	VM 317	Physiology V.....2	VM 319	Pharmacology I.....2
VM 313	Physiology Lab. I.....1	VM 315	Physiology Lab. II.....2	VM 318L	Physiology Lab. III.....1

SECOND YEAR

VM 405	Pathology I.....6	VM 406	Pathology II.....5	VM 423	Clinical Path.....5
VM 411	Vet. Micro. II.....6	VM 410	Vet. Parasitol. II.....5	VM 414	Vet. Med. I.....5
VM 403	Physiology VII.....4	VM 402	Pharmacology III.....4	VM 407	Pathology III.....4
VM 409	Vet. Parasitology I.....4	VM 412	Vet. Micro. III.....5	VM 413	Preventive Med.....4
VM 401	Pharmacology II.....3	VM 404	Physiology VIII.....3	VM 408	Lab. An. Md.....3
				VM 460	Clinic Elective.....1-2*

THIRD YEAR

VM 420	Vet. Med. II.....5	PH 422	Avian Diseases.....5	VM 440	Clinics VII.....7
VM 424	Vet. Med. & Surg. I.....5	VM 425	Vet. Med. & Surg. II.....5	VM 444	Clinics II.....7
VM 421	Vet. Surg. I.....3	VM 438	Vet. Med. IV.....4	VM 435	Therlogenology.....4
VM 427	Vet. Med. & Surg. II.....3	VM 422	Vet. Surg. II.....3	VM 448	Vet. Surg. IV.....1
VM 431	Vet. Radiology.....4	VM 451	Public Health II.....2	VM 453	Seminar.....2
VM 428	Diag. Clinics II.....1	VM 434	Applied Anatomy.....1		
VM 429	Clinics VI.....1	VM 426	Vet. Surg. III.....1		
VM 460	Clinic Elective.....1-2*	VM 433	Ther. Clinics.....1		
		VM 455	Phys. Diagnosis.....1		

FOURTH YEAR

VM 437	Vet. Med. III.....5	VM 442	Clinics IX.....7	VM 443	Clinics X.....7
VM 441	Clinics VIII.....7	VM 446	Clinics IV.....7	VM 447	Clinics V.....7
VM 445	Clinics III.....7	VM 453	Seminar.....2	VM 430	Junsp. & Ethics.....2
VM 449	Vet. Surg. V.....1	VM 439	Vet. Med. V.....5	VM 452	Public Health III.....2
VM 453	Seminar.....2	VM 450	Vet. Surg. VI.....1	VM 453	Seminar.....2

Spring Quarter

VM 454	Preceptorship.....0
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*Optional elective.

TOTAL—249 QUARTER HOURS

Graduate Programs

Master of Science degrees are offered in each department in the School of Veterinary Medicine. The Doctor of Philosophy degree is offered in a school-wide program. Refer to the *Graduate School Bulletin* for further information.

The Graduate School

PAUL PARKS, *Dean*

HUGH DONNAN, *Associate Dean*

DON RICHARDSON, *Associate Dean*

A STUDENT with a bachelor's degree from an accredited college or university may apply to the Dean of the Graduate School for admission. Application forms for admission may be secured from the Graduate School and must be submitted at least three weeks before registration.

The *Graduate School Bulletin* should be consulted for detailed information on the regulations of the Graduate School, the courses offered for graduate credit, the requirements for degrees, fellowships and assistantships, and other matters pertaining to graduate work in this institution. Undergraduates wishing to register for graduate courses should consult the *Graduate School Bulletin* for regulations concerning such registration. A bulletin may be obtained upon request from the Dean of the Graduate School.

Graduate Degrees

The Master's Program

Master of Science degrees are offered in the areas of Aerospace Engineering; Agricultural Economics and Rural Sociology; Agricultural Engineering; Agronomy and Soils; Anatomy and Histology; Animal and Dairy Sciences; Botany and Microbiology; Business; Chemical Engineering; Chemistry; Civil Engineering; Consumer Affairs; Counselor Education; Economics; Educational Leadership; Educational Media; Electrical Engineering; Elementary Education; Entomology; Family and Child Development; Fisheries and Allied Aquacultures; Forestry; Geology; Health, Physical Education and Recreation; Horticulture; Industrial Engineering; Large Animal Surgery and Medicine; Mathematics; Mechanical Engineering; Microbiology; Nuclear Science; Nutrition; Nutrition and Foods; Ornamental Horticulture; Pathology and Parasitology; Pharmacy; Physics; Physiology and Pharmacology; Poultry Science; Psychology; Secondary Education; Small Animal Surgery and Medicine; Sociology; Toxicology; Vocational and Adult Education; Wildlife Management; and Zoology.

Master of Arts degrees are offered in the areas of English; French; History; Political Science; Sociology; Spanish; and Speech Communication.

Other Master's Degrees: Master of Agriculture, Master of Arts in College Teaching, Master of Business Administration, Master of Education, Master of Electrical Engineering, Master of Fine Arts, Master of Forestry, Master of

French Studies, Master of Hispanic Studies, Master of Industrial Design, Master of Industrial Engineering, Master of Mechanical Engineering, Master of Music, Master of Regional Planning, Master of Speech Communication.

The Doctoral Degree Program

The **Doctor of Education** degree is offered with specializations in Counselor Education, Curriculum and Instruction, Educational Leadership, Elementary Education, Secondary Education, and Vocational and Adult Education.

The **Doctor of Philosophy** degree is offered in the Departments of Aerospace Engineering, Agricultural Engineering, Agronomy and Soils, Animal and Dairy Sciences, Botany and Microbiology, Chemical Engineering, Chemistry, Civil Engineering, Electrical Engineering, English, Fisheries and Allied Aquacultures, Forestry, History, Industrial Engineering, Mathematics, Mechanical Engineering, Physics, Psychology, Wildlife Management, and Zoology-Entomology, and interdepartmental programs in Microbiology, Nutrition, Physiology, and Veterinary Medicine.

Research Program with the Oak Ridge Associated Universities

Auburn University is one of the sponsoring institutions of the Oak Ridge Associated Universities research program located at Oak Ridge, Tennessee. Through this cooperative association Auburn's graduate research programs have at their disposal the facilities of the National Laboratories in Oak Ridge and the research staffs of these laboratories.

Information on the opportunities for research in the Oak Ridge Laboratories is available in the office of the Dean of the Graduate School.

Interdepartmental and Interdisciplinary Curricula

Undergraduate

Environmental Health (ENH)

THE CURRICULUM in Environmental Health is an interdepartmental program administered by a faculty committee from the Schools of Agriculture, Education, Engineering, Home Economics and Pharmacy and is based on the strengths of Auburn University in the biological and physical sciences.

Environmental health specialists are employed by industries, consultants, trade associations, and by governmental agencies to work in areas such as food sanitation, water supply sanitation, refuse and waste control, air pollution control, and institutional sanitation.

The program leading to a Bachelor of Science degree is designed to prepare graduates for careers in the broad field of environmental health. Interested students should contact Dr. R. Y. Cannon in the Animal and Dairy Science Department for further details concerning the program.

Curriculum in Environmental Health

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter					
CH	103	Fund. Chem. & Lab.	5	CH	104	Fund. Chem. & Lab.	5	BI	101	Prin. Biol.	5
MH	160	Pre-Cal. w. Trig.	5	MH	161	An. Geom. & Cal.	5	CH	105	Fund. Chem. & Lab.	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY	204	Tech. & Civiliz.	3	HY	205	Tech. & Civiliz.	3	HY	206	Tech. & Civiliz.	3
		Basic ROTC or PE	1			Basic ROTC or PE	1			Basic ROTC or PE	1

SOPHOMORE YEAR

BI	104	Biol. Human Affrs.	5	EC	200	Economics I	5	AM	304	Meteorology	5
SY	201	Intr. Socio.	5	PS	205	Physics	5	PS	206	Physics	5
CH	203	Org. Chem.	5	SC	202	App. Sp. Comm.	3	RSY	362	Comm. Organiz.	5
NF	112	Nutrition & Man.	3	CH	204	Anal. Chem. & Lab.	5	BY	216	Intr. Bio Comp.	3

JUNIOR YEAR

PG	212	Psychology	3	ZY	251	Physiology	5	MN	344	Envir. Law	4
ZY	250	Human Anat.	5	EH	304	Tech. Writing	3	ADS	204	Anim. Biochem. or	5
BY	300	Gen. Microbiol.	5			Elective	5	NF	318	Nut. Biochem.	5
		Elective	3	PY	563	Public Health	5			Elective	5
								IE	404	Occup. Hyg. Engr.	3

SENIOR YEAR

BY	501	Bio. Statistics	5	BY	541	Sanitary Microbiol.	5			Independent Study*	5
IE	438	Safety Engr.	5	ADS	515	Food Plant Sanitat.	3	CE	527	Water Supply & Trmt.	5
		Prof. Elective	8	CE	524	Air Pollution	5	PY	537	Fund. of Bionucleonics	3
						Prof. Elective	3			Prof. Elective	5

TOTAL—208 QUARTER HOURS

*An area of particular interest to the individual student can be selected for independent study, i.e. ADS 490, BY 460, CE 490, NF 408, PY 413, etc.

Graduate

Interdepartmental Programs

The Graduate School offers four interdepartmental programs which lead to the Doctor of Philosophy degree: Microbiology, Nutrition, Physiology, and Veterinary Medicine. Students in the interdepartmental Sociology program may earn the Master of Arts, Master of Science, or Master of Arts in College Teaching degree. Students in Nutrition and Physiology may also earn the Master of Science degree. These programs are supervised by coordinating committees appointed by the Dean of the Graduate School. Departments cooperating in the Microbiology program are: Agronomy and Soils, Animal and Dairy Sciences, Botany and Microbiology, Civil Engineering, Poultry Science, Veterinary Microbiology, Veterinary Pathology and Parasitology, and Zoology-Entomology. Departments and schools cooperating in the Nutrition program are: Animal and Dairy Sciences, Fisheries and Allied Aquacultures, Nutrition and Foods, and the School of Veterinary Medicine. The faculty and students in Physiology are drawn from the departments of Animal and Dairy Sciences, Chemistry, Physics, Poultry Science, Psychology, Veterinary Physiology and Pharmacology, Veterinary Anatomy and Histology, and Zoology-Entomology. The departments of Sociology and Anthropology, Agricultural Economics and Rural Sociology, and Foundations of Education are the cooperating departments in Sociology.

Interdisciplinary Program

The graduate program in Agricultural Engineering, leading to the Ph.D. degree, is an interdisciplinary program open to all students with undergraduate training in engineering equivalent to a B.S. degree.

The program is administered by a committee composed of representatives from the departments of Physics, Mathematics, the Associate Dean of Engineering, the Dean of Agriculture and the Head of the Department of Agricultural Engineering. This committee screens all doctoral candidates and their programs of study.

Students may pursue majors or minors in selected engineering disciplines having agricultural engineering applications.

Students wishing additional information on these programs should consult *The Graduate School Bulletin*.

Reserve Officers Training Corps

Department of Military Science

Lt. Col. Linus H. Fiely
Professor of Military Science

MILITARY SCIENCE INSTRUCTION leading to an Army commission as a second lieutenant is available to both male and female students. The Military Science curriculum is divided into two programs, Basic and Advanced. Program requirements are discussed in the following paragraphs.

Basic ROTC Program

The Basic Program, which consists of a wide variety of military science and physical education courses at the freshman and sophomore levels, is designed to prepare students for the Advanced ROTC program. Students are normally required to complete successfully any combination of six recognized 100 and 200 level courses in order to qualify. Basic Program courses are offered Fall, Winter, and Spring Quarters, with one credit hour being allowed for each course. Instruction is usually scheduled for one hour each week.

Basic Program courses are open to all students of the university and do not require a military commitment. Elective credits earned apply toward degree requirements in all schools of the University. Haircuts, uniforms, and drill are no longer required for participation.

In lieu of the Basic Program, interested students may attend the Basic Camp. This is normally accomplished between the sophomore and junior years. The Basic Camp consists of six weeks of training conducted at Fort Knox, Kentucky, during the summer.

Qualified veterans and three-year JROTC participants may enroll in the Advanced ROTC Program without taking the Basic Program, or attending Basic Camp.

Advanced ROTC Program

The Advanced Program is designed to produce officers for both the Active Army and the Reserve Components. Successful completion of the Advanced Program and degree completion qualifies the student for active duty as a second lieutenant. A program also exists wherein the student can be commissioned as a second lieutenant in the reserve components after completion of the Advanced Program, but prior to degree completion. Distinguished Military Students may apply for a Regular Army commission. The Advanced Program consists of a six quarter course, normally taken during the junior and senior years, and is sufficiently flexible to allow those who desire active duty to get it, or to guarantee duty with the reserve components for those who desire that particular option. Three credit hours per quarter are granted for completion of the Advanced Program. Students are paid a subsistence allowance of \$100.00 per month, not to exceed 600 days while enrolled in the Advanced Course.

An advanced camp of six weeks duration must be attended by the student before becoming eligible for a commission as a second lieutenant. Advanced camp is normally attended during the summer between the end of the junior and the start of the senior years. While attending advanced camp students are paid $\frac{1}{2}$ base pay of a second lieutenant and are reimbursed for travel expenses. Uniforms, lodging, medical care, and food are furnished by the government during the camp period.

Financial Assistance Program

The Army ROTC offers a scholarship program designed to provide financial assistance to outstanding men and women in the program who are interested in the Army as a career. Each scholarship provides free tuition, textbooks and laboratory fees in addition to pay of \$100.00 per month for the period that the scholarship is in effect.

Scholarships may be awarded for periods of one, two, three or four years. Four year scholarships are awarded to selected high school applicants who plan to attend a University offering Army ROTC in its curricula.

Three and two year scholarships are awarded to selected applicants who are qualified to enter the advanced program. A one-year scholarship is available to selected juniors on a competitive basis.

Department of Naval Science

CAPTAIN NEWTON C. YOUNGBLOOD, USN
Commanding Officer and Professor of Naval Science

THE PURPOSE of NROTC is to provide well-educated junior officers for the regular Navy and Marine Corps and to build up a reserve of trained officers for service in a national emergency. All NROTC programs are open to eligible women students.

TYPES OF NROTC STUDENTS

Students in the NROTC are of three types:

1. NROTC Navy-Marine Scholarship Program. Successful completion of this program leads to a commission in the regular Navy or Marine Corps and service at the pleasure of the President. The minimum active duty service is four years.

Tuition, fees, and textbooks for these students will be paid for by the Government. Students receive subsistence pay of \$100 per month for a maximum of 40 months. Active duty pay for summer training is approximately \$380 per month at present.

Although the Navy is emphasizing engineering and science majors, students may take most Auburn University majors leading to a baccalaureate degree with some exceptions. These will be considered on an individual basis by the Commanding Officer prior to appointment.

In addition to the requirements of their major, NROTC students are required to complete 29 quarter hours of Naval Science. Summer quarters are

occupied with two at-sea training cruises and one summer period of career orientation, lasting from four to eight weeks each.

Entrance to the Navy-Marine Scholarship Program is effected through nation-wide competition. Applicants must make independent arrangements to take either the Scholastic Aptitude Test or the American College Test at their own expense.

Scholarship students may resign without prejudice at any time prior to the beginning of their third year in the Program.

2. Four-Year NROTC Navy-Marine College Program. These students may become commissioned officers in the Navy or Marine Corps Reserve. They are entitled to subsistence pay of \$100 per month for a maximum of 20 months during their final two years of NROTC training, and summer cruise compensation. They are required to serve on active duty for three years and retain their commission for a total of six years from date of appointment, unless sooner released by the Secretary of the Navy. These students are selected by the Professor of Naval Science.

Students in the four-year program who have not yet received the \$100 per month subsistence payments may resign from the NROTC Program without prejudice.

3. Two-Year NROTC Navy-Marine Program. Selections for this program are made on a national basis from nominations submitted by the Professors of Naval Science. Selected applicants will attend a Naval Science Institute (NSI) of six weeks duration during the summer prior to their junior year. Successful completion of the NSI will qualify these students for enrollment in the advance course in the NROTC College Program.

Students in both the latter programs may apply for the Scholarship Program through national competition, or for Professor of Naval Science nomination for appointment as Scholarship students.

The student must complete all Naval Science requirements prior to or concurrently with receipt of a baccalaureate degree. Summer training consists of an at-sea training cruise between the junior and senior years.

Qualifications for enrollment, application blanks and information bulletins are available each Fall at high schools, colleges, Recruiting Stations, and the NROTC Unit.

Equipment

Uniforms, Naval Science textbooks, and equipment necessary to the NROTC Program are furnished in all programs.

Curriculum

Naval Science curriculum consists of the following hours per week: freshman and sophomore Naval Science courses and Marine Corps option courses, four hours; junior and senior Navy courses, five hours.

Naval Science subjects carried during the four-year curriculum are listed in the Description of Courses section of this Bulletin. Only the 300/400 series subjects are applicable to the Two-Year Program.

Freshman, sophomore, and Marine Corps option courses carry two quarter hours of credit and the junior and senior courses carry three quarter hours of credit. These hours of credit will be considered as a part of the normal quarterly load; however Auburn University graduation requirements will be increased by 12 to 18 hours, depending upon the school in which enrolled, over the number of hours listed in the University catalog. Navy option scholarship students must also complete courses in calculus and physics.

Department of Air Force Aerospace Studies (AFROTC)

COLONEL ROBERT E. HALL

Professor of Aerospace Studies and Commander

AFROTC is the nation's largest source of Air Force Officers. It provides a basic understanding of the role of air power and management of the Air Force. Enrollment in the General Military Course is open to all freshmen and sophomore men and women and does not require a military commitment. The Professional Officer Course is open to qualified men and women and leads directly to an Air Force commission.

General Military Course

(Basic Course)

The General Military Course is composed of one class hour and one Leadership Laboratory hour per week. One credit hour is allowed for each quarter of the six quarter basic course. Leadership Laboratory includes briefings by various Air Force commands and staff agencies and related corps projects. Students are provided the opportunity to visit various Air Force bases to acquaint them with operational Air Force units.

Applicants for the Advanced Officers Course attend a summer Field Training Course between their sophomore and junior years. The Air Force furnishes uniforms, housing, medical care, rations, a round trip travel allowance and military pay at field training.

Professional Officer Course

(Advanced Course)

The Professional Officer Course consists of a six-quarter course normally taken during the junior and senior year. Enrollment in the advanced course is also open to graduate students if they have six-quarters of school remaining. Three classroom hours of instruction and one hour of Leadership Laboratory are taken per week. Three credit hours per quarter or a total of 18 credit hours are granted for completion of the Professional Officer Course; however, only six to 12 credit hours may be applied towards the total credits required for graduation. Students enrolled in the program are given a monthly subsistence allowance and those selected for the pilot category are eligible for the Flight Instruction Program.

College Scholarship Program

Four, three and two-year Air Force ROTC scholarships are available for male and female students who qualify. Scholarships provide full tuition, laboratory expenses and incidental fees to include textbooks, \$100 a month allowance (tax free), and all uniform items. Scholarships are awarded to qualified students based on application to, and selection by central selection boards.

Flight Instruction Program

The Flight Instruction Program is conducted during the cadet's last year in AFROTC and provides the pilot category cadets with 25 hours of flight training. The primary purpose of this training is to determine a cadet's aptitude for flying and to motivate him toward a career as an Air Force pilot. The Flight Training, provided by Auburn University at no expense to the student, is conducted under a contract with the Air Force, and is monitored by the FAA.





Courses of Instruction

IN THIS SECTION are listed and described all courses taught by the departments of the University. The courses are presented by subjects, arranged alphabetically. The subject name (the heading in large type) is followed by the departmental symbol in parentheses. Below the subject appears a list of the departmental faculty.

The subject name (symbol) together with the course number constitutes the official designation for the course for purposes of registration and official records. The specific course title appears in boldface following the course number. The figures in parentheses denote the number of quarter hours of credit for the course. Following the credit hours are listed lecture and laboratory clock hours, if applicable. If none is listed, the course consists of lecture hours equal in number to course credit. Next appear the prerequisites, if applicable.

Courses are numbered according to the following system:

- 101-199** Courses primarily for freshmen.
- 201-299** Courses primarily for sophomores.
- 301-399** Courses primarily for juniors.
- 401-499** Courses primarily for seniors. Not open to graduate students.
- 501-599** Courses for advanced undergraduate and graduate students; and for fifth year students in professional curricula.
Junior Standing Required For Enrollment At This Level.
- 601-799** Courses for graduate students

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Note: COI Is Used For Consent Of Instructor In Course Description Headings.

University Courses (U)

The following courses, interdisciplinary and experimental in character, are designed to enable the student to see in a wide perspective the relationship of individual courses in his curriculum and to understand more fully the dominant ideas and concepts confronting him in the modern world. University Courses are open to students in all curricula.

190. **THEORY AND PRACTICUM IN COLLEGIATE SPORTS (1).** Conditioning activities in preparation for competitive football. Skills and fundamental techniques of physical activities related to football. Coaching techniques applicable to all areas of athletic competition.
201. **FORUM (1).** May be taken more than one quarter for a maximum of 3 credits. S-U only. Credit is given in recognition of significant attendance at public academic lectures, concerts, and other events. Requires attendance at seven of the 15-20 FORUM-designated events, which are chosen from various University lecture and concert series and departmental programs. Administered by Department of Political Science.
210. **THE NATURE OF MATERIALS FOR LIVING (5). LEC. 4, LAB. 1.** Pr., sophomore standing. The structures and properties of the principal classes of useful materials are described in relation to their applications. Topics will include metals, ceramics, plastics, compatibility, durability, and appearance as related to consumer goods, housing, and environment. The laboratory will include related films, demonstrations, and tests performed by students. Administered by Department of Mechanical Engineering.
- 270-271-272. **ASCENT OF MAN (3). LEC. 2, LAB. 1.** Based on the films and text prepared by Jacob Bronowski, the course deals with the historic interaction between science and culture. Students view each week one film segment in the *Ascent of Man* series, with subsequent small-group classroom sessions devoted to discussion of the film and auxiliary readings.
275. **INTERPERSONAL RELATIONS (3).** A multi-disciplinary study of methods used by human beings in their interactions that tend to be mutually rewarding. Emphasis is on practical applications within the context of the student's present fields of study and projected fields of work.
305. **THE MODEL UNITED NATIONS (1).** May be taken more than one quarter for a maximum of 3 credits. S-U only. Preparation of materials for, and active participation in, the sessions of the Model United Nations program held annually on the campus. Administered by Department of Political Science.

399. **EXPERIENTIAL LEARNING (2-6).** Pr., sophomore standing and COI. May be repeated once for credit. Students may obtain academic credit for participation in learning experiences of a practical nature available outside the normal curricular offerings of the University.

Accounting and Finance (ACF)

Professors Hartman, Hill, Robinson, and Thorne

Associate Professors Criss, Edmonds, Hale, Hand, Lindbeck, and Miley

Assistant Professors Rogow, Head, Alderman, Beard, Dinius, Farmer, McCord, Rose, Tole, Williams, and Worthington

Instructors Brown, Evans, Haygood, Modani, Price, Roberts, and Walker

ACCOUNTING

211. **PRINCIPLES OF ACCOUNTING I (4).** LEC. 3, LAB. 2. Pr., sophomore standing. Basic accounting principles, including the accounting cycle and preparation of financial statements. ACF 211 is not open to students with credit in ACF 215.
212. **PRINCIPLES OF ACCOUNTING II (4).** LEC. 3, LAB. 2. Pr., ACF 211. A continuation of accounting principles with emphasis on their application to partnerships, corporations, and preparation and analysis of various financial statements.
215. **FUNDAMENTALS OF GENERAL AND COST ACCOUNTING (5).** LEC. 3, LAB. 4. Pr., sophomore standing. Fundamental concepts and principles of general and cost accounting. Emphasis on accumulating, reporting, and interpreting cost data in the production area of business operations. (Not open to undergraduates majoring in Business. Credit in ACF 211 precludes credit for ACF 215.)
310. **MANAGERIAL COST AND BUDGETING (4).** LEC. 3, LAB. 2. Pr., ACF 212. The third course for accounting majors or a terminal course for non-accounting majors. Introductory cost accounting and budgeting with some emphasis on distribution costs and managerial accounting problems. ACF 310 and 311 may be taken independently or concurrently; both are prerequisites for ACF 312.
311. **INTERMEDIATE ACCOUNTING I (5).** Pr., ACF 212. Accounting principles and theory, including a review of the accounting cycle and accounting for current assets, current liabilities, and investments. ACF 310 and 311 may be taken independently or concurrently; both are prerequisites for ACF 312.
312. **INTERMEDIATE ACCOUNTING II (5).** Pr., ACF 310 and 311. A continuation of accounting principles and theory with emphasis on accounting for fixed assets, intangibles, long term liabilities, corporate capital structure, analysis of financial statements and funds flow.
314. **INCOME TAX ACCOUNTING (5).** Pr., ACF 212. Interpretation of the regulations; preparation of returns, and the keeping of accounting records for tax purposes.
410. **COST ACCOUNTING (5).** Pr., ACF 310 and junior standing. Accounting principles and procedures involved in job-order, process, and standard cost accounting.
414. **ADVANCED INCOME TAX ACCOUNTING (5).** Pr., ACF 312, 314 and junior standing. Special tax accounting problems of individuals, partnerships, corporations, estates, and trusts. Extensive use will be made of a tax service program.
415. **BUSINESS INFORMATION AND ACCOUNTING SYSTEMS (5).** Pr., ACF 312 and senior standing. The design, installation, operation, and interrelationship of accounting systems which constitute the information flows and provide the basis for financial decisions in modern organizations.
416. **AUDITING (5).** Pr., ACF 312 and senior standing. The principles of auditing with particular attention to methods of testing, analyzing, and summarizing accounting records.
417. **ADVANCED ACCOUNTING (5).** Pr., ACF 312, 410, and junior standing. Specialized accounting problems, including application of quantitative methods.
418. **BUSINESS COMBINATIONS AND OTHER PROBLEMS (5).** Pr., ACF 312 and junior standing. Accounting for business combinations, home and branch office procedures, partnerships, installment sales, consignments, and receiverships.
419. **GOVERNMENTAL ACCOUNTING (5).** Pr., ACF 312 or ACF 312 concurrently and junior standing. Budgeting and accounting procedures of governmental divisions.
490. **SPECIAL PROBLEMS. (1-10).** Pr., ACF 312 and senior standing. Advanced individual research and study of accounting and finance under guidance of a faculty member.
491. **VETERINARY BUSINESS METHODS (3).** LEC. 3, LAB. 1. Pr., 4th yr. Summer. Various aspects of business methods and legal concerns in starting a veterinary practice. Emphasis on accounting systems, record keeping procedures and taxation.
499. **SEMINAR IN CURRENT ACCOUNTING TOPICS (1).** Pr., graduating seniors. The current literature, problems, and controversies affecting the accounting profession.

GRADUATE

- 513. **FOUNDATIONS IN ACCOUNTING FOR MANAGEMENT (5).** Pr., MH 140 and consent of the Director of Graduate Studies, School of Business. An accelerated course in accounting fundamentals and business applications.
- 510. **MANAGERIAL ACCOUNTING (5).** Pr., ACF 212 or 513. For the MBA student confronted with business problems requiring a comprehensive understanding of accounting concepts, and accepted methods of applying these concepts in decision-making, planning, and control.
- 511. **ADVANCED ACCOUNTING THEORY (5).** Pr., ACF 312. A review of the origin and development of double-entry accounting; followed by a critical study of the theory of modern accounting principles and procedures.
- 514. **RESEARCH IN FEDERAL TAXATION (5).** Pr., graduate standing and COI. Analysis of federal taxation problems and relationships among code provisions, generally accepted accounting principles, and business decisions.
- 515. **FINANCIAL INFORMATION SYSTEMS (5).** Identification, evaluation, and modification of critical information flows into efficient and effective information systems to service modern management decision needs.
- 516. **ADVANCED AUDITING (5).** Pr., ACF 416. Application of auditing principles and procedures to practical problems in public and private accounting.
- 517. **ADVANCED ACCOUNTING PROBLEMS (5).** Pr., ACF 417. An extension and a consolidation of all the other advanced accounting courses. Preparation for special accounting examinations.
- 521. **DEVELOPMENT OF ACCOUNTING THOUGHT (5).** The origin and development of accounting theories and concepts.
- 550. **SEMINAR (1-10).** Intensive study and analysis of accounting and finance problems.
- 581. **DETERMINISTIC QUANTITATIVE METHODS IN ACCOUNTING (3).** Pr., MN 581 or equivalent. Deterministic quantitative methods for business applications. (Same as MN 581.)
- 582. **STOCHASTIC QUANTITATIVE METHODS IN ACCOUNTING (3).** Pr., MN 581 or equivalent. Various quantitative methods applied to decision-making under conditions of risk and uncertainty. (Same as MN 582.)
- 584. **SEMINAR IN TAX FACTORS IN MANAGEMENT DECISIONS (5).** Pr., ACF 610 and COI. Primarily non-technical. Study of tax consequences apt to attach to common business transactions.
- 590. **SPECIAL PROBLEMS (1-15).** Variable content in the accounting areas.
- 599. **RESEARCH AND THESIS.** Credit to be arranged.

FINANCE

- 320. **RISK AND INSURANCE (5).** Pr., EC 200 and junior standing. Essentials of risk management, with the emphasis on the use of insurance in meeting these risks; including the characteristics of property, liability, life and health insurance.
- 321. **PROPERTY INSURANCE (5).** Pr., ACF 320. The principles, uses and types of insurance with particular emphasis on fire, marine, automobile, and casualty lines.
- 322. **LIFE INSURANCE (5).** Pr., ACF 320. The organization of the life insurance business and the various types of contracts.
- 323. **REAL ESTATE (5).** Pr., EC 200 and junior standing. The fundamental principles and practices as applied to the purchase, sale, lease, mortgage, title, and management of real estate.
- 340. **PERSONAL FINANCE (3).** Pr., non-business student, junior standing. Plans for managing personal financial problems involving insurance, housing, household budgeting, investments, personal and bank loans, credit and time buying, etc.
- 361. **PRINCIPLES OF BUSINESS FINANCE (5).** Pr., EC 202 and ACF 212. Short-term, intermediate and long-term financing of business firms.
- 363. **ADVANCED BUSINESS FINANCE (5).** Pr., ACF 361. A continuation of ACF 361 with emphasis on capital budgeting, cost of capital, growth, promotion, and reorganization.
- 367. **MONEY MARKETS AND FINANCIAL INSTITUTIONS (5).** Pr., ACF 212, EC 202 and junior standing. Structure and operation of commercial banks and other financial institutions and their role in the financing of business.
- 369. **MANAGEMENT OF FINANCIAL INSTITUTIONS (5).** Pr., ACF 361 and 367. Concentration on internal operations of financial institutions, especially banks.
- 451. **MULTINATIONAL FINANCIAL MANAGEMENT (5).** Pr., ACF 363 or COI. The impact of various tax regulations, currency controls and exchange rates on the multinational firm.
- 464. **INVESTMENTS (5).** Pr., ACF 361, junior standing. Individual investment policies, investment institutions, and types of investments available.
- 466. **SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT (5).** Pr., ACF 464 and junior standing. Analysis techniques and selection of securities to meet specific investment objectives.

467. **CONSUMER FINANCE (5).** Pr., ACF 361 or COI. Analysis of the growth of consumer credit in the United States with emphasis upon recent legal and technological changes in the field of credit.
490. **SPECIAL PROBLEMS. (1-10).** Pr., ACF 363 and senior standing. Advanced individual research and finance under guidance of a faculty member.

GRADUATE

561. **CONCEPTS OF MANAGERIAL FINANCE (5).** Pr., MH 140 and consent of the Director of Graduate Studies, School of Business. An accelerated course in finance and business applications.
620. **RISK MANAGEMENT IN THE BUSINESS ENTERPRISE (5).** Pr., COI. An analysis of the appropriate methods used by businesses and other organizations to manage static risk.
650. **SEMINAR (1-10).** Intensive study and analysis of accounting and finance problems.
651. **ADVANCED MULTINATIONAL FINANCIAL MANAGEMENT (5).** Pr., ACF 361 or 561. Finance related problems and policies of the multinational firm; emphasizing taxes, accounting, exchange risk, and capital budgeting.
663. **ADVANCED CORPORATION FINANCE (5).** Pr., ACF 361 or 561. Intensive study of theory and problems of business finance from a decision-making, internal, problem-solving point of view.
665. **CASES IN FINANCIAL MANAGEMENT (5).** Pr., ACF 663. The application for formal analytical techniques to practical business situations requiring financial decisions through use of the case approach.
690. **SPECIAL PROBLEMS (1-15).** Variable content in the finance areas.

Aerospace Engineering (AE)

Professors Pitts, Head, Haneman, Martin, and Sforzini
Associate Professors Cutchins, Nichols, and Cochran
Assistant Professors Burkhalter and Foster

203. **AEROSPACE FUNDAMENTALS (3).** LEC. 2, LAB. 3. Aerospace concepts and terminology. General schemes and designs of aerospace systems and applications of computers to same. Duplicate credit will not be given for AE 203 and IE 204 or similar courses which include FORTRAN programming instruction.
300. **AEROSPACE ANALYSIS I (3).** Pr., MH 265. Special methods and notations used in Aerospace Engineering.
302. **AIRLOADS (4).** LEC. 3, LAB. 3. Pr., ME 340. Application of the basic equations of fluid dynamics to the prediction of pressure distribution, wing loading and hinge moments. Propeller design and selection.
303. **THEORETICAL AERODYNAMICS I (4).** Pr., ME 340 and AE 300. Fundamental analysis of aerodynamics, potential flow theory. Correlation of potential flow theory with experimental results.
304. **THEORETICAL AERODYNAMICS II (4).** LEC. 3, LAB. 3. Pr., AE 303. Fundamental principles of compressible flow including subsonic, transonic, supersonic, and hypersonic aerodynamics. High speed wind tunnels and laboratory techniques.
305. **FLIGHT PERFORMANCE (3).** Pr., AE 302. Equations of motion and solution techniques for vehicle performance analysis including effects of propulsion system and aerodynamic variations.
307. **AEROSPACE STRUCTURES I (5).** LEC. 4, LAB. 3. Pr., ME 207. Basic structural analysis. Shear and bending in monocoque structures. Deflections of beams and frames. Column and plate buckling. The laboratory portion is devoted to experimental techniques in stress analysis.
310. **AEROSPACE ANALYSIS II (4).** Pr., MH 265, ME 321. Linear and non-linear systems, linearization procedures, and linear systems analysis techniques. Other special techniques as required by advanced courses.
311. **AEROSPACE MATERIALS AND METHODS OF CONSTRUCTION (2).** Pr., AE 307. Nomenclature, coding systems, physical and structural properties, applications and fabrication techniques as applied to aerospace materials.
326. **FUNDAMENTALS OF AEROSPACE DYNAMICS (3).** Pr., AE 310. Dynamics of aerospace vehicles in moving reference frames; Eulerian formulation for the vehicle as a rigid body; Lagrangian formulation and small oscillation theory. Provides a unified basis for further studies in aircraft vibration, flight dynamics, and space flight mechanics.
330. **AEROSPACE INSTRUMENTATION (3).** LEC. 2, LAB. 3. Pr., EE 261. Basic theory and principles of operation of instrumentation used in Aerospace applications. System approach in taking measurements for Aerospace systems.
401. **AEROSPACE PROBLEMS I (1).** LAB. 3. Pr., EH 304 or COI, senior standing. Investigation of current aerospace problems, preparation and presentation of technical papers and reports.
402. **AEROSPACE PROBLEMS II (1).** LAB. 3. Pr., AE 401. Continuation of AE 401.

409. **AEROSPACE STRUCTURES II (5). LEC. 4, LAB. 3.** Pr., AE 203 or equivalent knowledge of FORTRAN programming, AE 307, 310. A continuation of AE 307. An introduction to the finite element method. The laboratory portion is devoted to the solution of structural problems on the digital computer.
427. **ENGINEERING METEOROLOGY (3). LEC. 3.** Atmospheric composition, temperature distributions, stability-instability relationships with application to physical weather phenomena. The physics of precipitation, adiabatic charts, winds, and elementary forecasting.
439. **STATIC STABILITY AND CONTROL (4). LEC. 3, LAB. 3.** Pr., AE 304. Introduction to static stability and control of flight vehicles including laboratory techniques for determination of stability parameters.
448. **AEROSPACE DESIGN I (1). LAB. 3.** Pr., senior standing. An application of the design process oriented toward the aerospace field with emphasis on the development of creative thinking and team effort. A two quarter sequence with AE 449.
449. **AEROSPACE DESIGN II (1). LAB. 3.** Pr., AE 448. A continuation of AE 448.
491. **SPECIAL PROBLEMS (1-5 CREDIT HOURS TO BE ARRANGED).** Pr., departmental approval. Not open to graduate students.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **VISCOUS AERODYNAMICS (4). LEC. 3, LAB. 3.** Pr., AE 304. Theoretical background essential to a fundamental understanding of laminar and turbulent boundary layers and their relations to skin friction and heat transfer. Experimental techniques.
501. **ADVANCED THREE-DIMENSIONAL AERODYNAMICS (3-5 CREDIT HOURS TO BE ARRANGED).** Pr., AE 304 and COI. Advanced concepts in the application of aerodynamic principles to finite wings and bodies, thickness effects, interference effects and computer simulation.
514. **EQUILIBRIUM GAS DYNAMICS (3).** Pr., COI. Basic concepts of The Equilibrium Kinetic Theory and the equilibrium real gas properties. Aero-thermodynamic fundamentals of external flows for various atmospheric flight conditions in terms of flight speeds, altitudes and vehicle geometry.
515. **JET PROPULSION (5).** Pr., coreq., AE 304. Internal aerodynamics and thermodynamics of rockets and air-breathing jet engines. Jet nozzles. Detailed analysis of flow through turbojet compressors, combustors and turbines.
516. **ROCKET PROPULSION I (3).** Pr., AE 515. Detailed analysis of the thermodynamics, gasdynamics, and design of liquid-propellant rockets.
517. **ROCKET PROPULSION II (3).** Pr., AE 515. Design and performance analysis of solid-propellant rocket motors with emphasis on internal ballistics.
520. **DYNAMIC SIMULATION (3).** Pr., AE 326. Computer techniques applied to the analysis of aerospace engineering problems using analog and hybrid computers and the digital problem-oriented language. Continuous System Modeling Program (CSMP).
521. **FLIGHT VEHICLE STRESS ANALYSIS (3).** Pr., AE 409. Stress analysis of pressure chambers and vessels encountered in aerospace applications.
524. **NONEQUILIBRIUM GAS DYNAMICS (3).** Pr., COI. Nonequilibrium Kinetic Theory of real atmospheric gases. Applications of the thermal and chemical nonequilibrium conditions to the external flows for various flight conditions.
528. **SPACE PROPULSION SYSTEMS (5).** Pr., AE 515. Introduction to reaction engines for use in outer space vehicles. Power requirements for space missions, nuclear power systems, ion engines, magnetohydrodynamics and plasma accelerators, and photonic engines.
529. **AIRCRAFT VIBRATION AND FLUTTER (4).** Pr., AE 326, AE 409. Free, forced, and damped vibration of single and multiple degree-of-freedom systems; introduction to vibration of continuous systems; introduction to flutter theory; applications in aerospace.
532. **ASTRODYNAMICS I (3).** Pr., AE 326 or COI. Geometry of the solar system, detailed analysis of two-body dynamics and introduction to artificial satellite orbits; Hohmann transfer and patched conics for lunar and interplanetary trajectories. Elements of orbit determination.
533. **ASTRODYNAMICS II (3).** Pr., AE 532. Elements of special and general perturbation theory; n-body formulation and introduction to 3-body problem; introduction to powered flight analysis and space flight guidance.
534. **AEROSPACE SYSTEMS ANALYSIS (3).** Pr., AE 310. Modeling of system elements, analysis of systems undergoing various motions connected with flight, and introduction to optimal linear control systems.
535. **ELEMENTS OF V/STOL FLIGHT (3).** Pr., AE 303 or COI. The analysis of methods for generating high lift at low vehicle forward speeds.
536. **ROTARY WING AERODYNAMICS (3).** Pr., AE 305. Aerodynamics and flight characteristics of the rotary wing aircraft.
541. **DYNAMIC STABILITY AND CONTROL (3).** Pr., AE 326, 439, 534. Derivation of the kinematic and dynamic equations used to describe the motions of aircraft. Analysis of the stability of steady state flight conditions. Response of aircraft to actuation of controls.
542. **AUTOMATIC STABILITY AND CONTROL (3).** Pr., AE 541. Principles and techniques of automatic control of aircraft and missiles. Effects on design variables.

543. **FLIGHT SIMULATION (3 CR. HR.)**. Pr., AE 541 and COI. Time domain simulation to the nonlinear six-degree-of-freedom motion of aircraft. Models for aerodynamics, propulsion and control systems. Special computer techniques applied to the generation of various flight profiles.
545. **MISSILE AERODYNAMICS (3)**. Pr., AE 304, AE 439. The aerodynamics of slender wing-body configurations for the low supersonic, moderate hypersonic and Newtonian continuum flow regimes. Linear and non-linear effects are considered as well as interference effects. Application to missile performance and stability for certain flight profiles.

GRADUATE

601. **ADVANCED SUPERSONIC AERODYNAMICS (5)**. Pr., AE 500. A rigorous development of linearized and nonlinear fluid flow theories and application. Lifting surfaces, lifting bodies, duct flow, boundary layer effects, shock and expansion waves, and method of characteristics are considered.
602. **ADVANCED ELEMENTS OF HIGH SPEED AERODYNAMICS (5)**. Pr., AE 601 or equivalent. A continuation of AE 601 to include three-dimensional wing theory; slender body theory and similarity laws for subsonic, supersonic and hypersonic flow conditions.
603. **HIGH-SPEED VISCOUS AERODYNAMICS (5)**. Pr., AE 602 or equivalent. A continuation of AE 602 to include effects of conductivity and viscosity on aerodynamic properties.
604. **ADVANCED LOW SPEED AERODYNAMICS (3-5 HRS. CREDIT TO BE ARRANGED)** Pr., AE 300, 303. Theoretical analysis of two dimensional airfoils. Joukowski transformations, Theodorsen's theory and other techniques for determining flow characteristics over any two-dimensional airfoil. Finite wing analysis, lift distribution on finite wings.
605. **AEROELASTICITY (3-5 HOURS CREDIT TO BE ARRANGED)**. Pr., AE 529. May be taken more than one quarter, not to exceed 10 hours. General formulation of aeroelastic problems, divergence, flutter and loss of control, dynamic stresses, panel flutter.
608. **AEROSPACE STRUCTURAL DYNAMICS (3-5 HOURS CREDIT TO BE ARRANGED)**. Pr., AE 529. Advanced theory of matrix structural analysis with applications to dynamics of flight.
609. **ADVANCED AERO-STRUCTURES (3)**. Pr., AE 529. Vibrations of solids and wave propagation, introduction to general methodology and thermodynamics of solids, derivation of large-deflection equations, principles of basic solids investigations, and application to aerospace structures.
610. **ADVANCED VIBRATIONS PHENOMENA (3-5 HOURS CREDIT TO BE ARRANGED)**. Pr., AE 529. Aerospace applications of dynamic phenomena measurement including linear varying differential transformers, piezoelectric accelerometers, dynamic force gages, and strain gages. On line use of hybrid and digital computers for data analysis and combined experimental simulation involving both experiment and computer. Use of various types of shakers in dynamic tests.
611. **THRUST GENERATION (5)**. Pr., AE 515. Aerothermodynamics of compressible flow, chemical propellant characteristics, heat transfer in fluid flow, nuclear propulsion.
612. **AEROTHERMOCHEMISTRY OF PROPULSION (3-5 CREDIT HOURS TO BE ARRANGED)**. Pr., AE 611 or COI. Selected topics emphasizing interrelation between internal aerodynamics and combustion phenomena in air-breathing jet engines and rockets. Various techniques of establishing equilibrium composition and flame temperatures; comparison of frozen and equilibrium flow in nozzles; effects of condensed phases; supersonic combustion.
613. **ADVANCED AIR-BREATHING PROPULSION (3-5 CREDIT HOURS TO BE ARRANGED)**. Pr., AE 611 or COI. Selected topics emphasizing interaction between external aerodynamics and performance of air-breathing jet engines, boundary layer effects in diffusers and compressors, and detailed analysis of various techniques of minimizing detrimental effects, compressor and turbine matching in turbojets, cascade aerodynamics, and variable area jet nozzles.
615. **HYPERSONIC FLOW THEORY (3-5 HOURS CREDIT TO BE ARRANGED)**. Pr., AE 500, coreq. MH 461. May be taken more than one quarter, not to exceed 15 hours. Hypersonic continuum theory, governing equations of motion for two and three dimensional flows, hypersonic small disturbance theory, viscous effects. Real gas effects in gas dynamics and rarefied gas flows, basic heat transfer concepts.
616. **REAL GAS DYNAMICS (3-5 HOURS CREDIT TO BE ARRANGED)**. Pr., COI. May be taken more than one quarter, not to exceed 15 hours. A microscopic approach to gas dynamics based on quantum mechanical models and statistical techniques.
617. **MOLECULAR THEORY OF AERODYNAMICS (3-5 HOURS CREDIT TO BE ARRANGED)**. Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Free molecular, near-free-molecular, and transition flows of neutral gases are considered. Basic equations are developed and selected geometries are treated in detail.
619. **DYNAMICS OF FLIGHT (5)**. Pr., AE 541 or COI. Derivations of equations of motion for variable-mass and flexible flight vehicles; small-disturbance theory and the linearized solutions of the general equations of unsteady motions, aerodynamic derivative, derivatives analysis, aerodynamic transfer functions, dynamic stability of uncontrolled longitudinal and lateral motions.
620. **FLIGHT DYNAMICS OF HYPERVELOCITY VEHICLES (3-5 HOURS CREDIT TO BE ARRANGED)**. Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Flight dynamics of steady and unsteady flight at hypersonic speeds, great-circle and minor-circle flight, re-entry, stability derivatives in hypersonic flow. Linearization of equations is investigated; static stability problems of hypervelocity vehicles are discussed.
632. **ADVANCED ASTRODYNAMICS (3-5 CREDIT HOURS TO BE ARRANGED)**. Pr., AE 533 or COI. May be taken more than one quarter, not to exceed 15 hours. Selected topics from indirect and direct methods of trajectory optimization, trajectory isolation techniques, special and general perturbation theories, oblate earth problem, three body problem, space craft rotational motion, mission analysis methods, and new research developments.

635. **ION AND PLASMA PROPULSION (5).** Pr., COI. Basic physical and gas dynamic processes underlying methods for electrical acceleration of ionized gas flows appropriate to electrothermal propulsion, electrostatic propulsion, electromagnetic propulsion.
639. **PARTICLE KINETICS OF PLASMAS (3-5 HOURS CREDIT TO BE ARRANGED).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Gaseous plasmas based on the theory of individual particle kinetics. Emphasis will be placed on the development of basic concepts with sufficient generality to allow treatment of non-equilibrium problems of interest in aerospace research.
640. **MAGNETO-GAS DYNAMICS (5).** Pr., COI. Review of electrodynamics, Maxwell stresses, field and momentum-energy tensors. Thermo-dynamics of fluids in electromagnetic fields. Equations of motion of a conducting gas. Discussion of typical flow problems. Consideration of microscopic aspects of plasma flows.
645. **SHOCK TUBE THEORY AND TECHNIQUES (5).** Pr., COI. Shock wave theory in real and perfect gases, expansion wave theory, reflected shock wave theory. Basic shock tube equations; effects of area change, driver types and characteristics. Non-ideal behavior in shock tubes, diaphragm opening effects, boundary layer effects, shock wave attenuation. Testing time derivation. Shock tube techniques and measurements.
646. **PLASMA DIAGNOSTICS (3-5 HOURS CREDIT TO BE ARRANGED).** Pr., COI. May be taken more than one quarter, not to exceed 15 hours. Theoretical and applied studies of techniques for the measurement of plasma properties. The application of these techniques to aerospace research and testing.
690. **SEMINAR. CREDIT TO BE ARRANGED.** May be taken more than one quarter. Provides weekly lectures on current developments in aerospace sciences by staff members, graduate students, and visiting scientists and engineers.
691. **DIRECTED READING IN AEROSPACE ENGINEERING. (CREDIT TO BE ARRANGED, NOT EXCEEDING 5 HOURS.)** May be taken more than one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Aerospace Studies (AF)

- 101-102-103. **THE AIR FORCE TODAY (1-1-1). LEC. 1, LAB. 1.** The history, organization and mission of the United States Air Force, introduction to strategic offensive/defensive forces, general purpose forces, and aerospace forces.
- 201-202-203. **THE DEVELOPMENT OF AIR POWER (1). LEC 1, LAB.1.** Development of air power over the past sixty years. Focusing on technological change and concepts of employment.
- 301-302-303. **AIR FORCE MANAGEMENT AND LEADERSHIP (3-3-3). LEC. 3, LAB.1** Fundamentals of communication skills, the management process, and Air Force leadership.
- 401-402-403. **NATIONAL SECURITY FORCES IN CONTEMPORARY AMERICAN SOCIETY (3-3-3). LEC. 3, LAB.1.** Examination of national defense policy and civil-military relationship. Preparation for initial active duty.

Agricultural Economics and Rural Sociology (AEC) (RSY)

Professors Yeager, *Head*, Bell, White, and Wilson
Associate Professors Clonts, Dunkelberger, Hardy, Martin, McCoy, and Stallings
Assistant Professors Adrian, Molnar, and Vanlandingham
Joint Appointee: Prof. Griessman, Sociology

AGRICULTURAL ECONOMICS (AEC)

202. **AGRICULTURAL ECONOMICS I (5).** All quarters. Economic principles with emphasis on farm-related production, marketing, prices, consumption, taxation, credit, finance, public policies and tenure. Treats utilization of land, labor, and capital. Credit not allowed in this course and EC 200.
206. **AGRICULTURAL ECONOMICS II (5).** Pr., AEC 202 or equivalent. Continuation of economic principles with emphasis toward micro-economic concepts relating to farm firm. Credit not allowed in this course and EC 202.
301. **AGRICULTURAL MARKETING (5).** Pr., AEC 202 or equivalent. Principles and problems in marketing farm products. Analysis of marketing functions, services, and costs; reducing costs and improving marketing efficiency. Marketing methods and distribution channels of major farm commodities. Market institutions and operation.
302. **FARM RECORDS AND TAX MANAGEMENT (5).** Pr., AEC 202 or equivalent. Types and uses of farm records and accounts with emphasis on analyzing records to improve net farm income. Interpretation of income tax regulations and preparation of farm tax returns with emphasis on tax management.
303. **AGRICULTURAL COOPERATIVES (3).** Pr., AEC 202. Principles and problems of organizing and operating farmers' cooperative buying and selling associations.
304. **AGRICULTURAL FINANCE (3).** Pr., AEC 202. Economic problems and policies in financing agriculture.

- 305. **FARM APPRAISAL (3).** Pr., AEC 202. Theory of land values; techniques on farm land and building appraisals for different purposes; relationships of land use, buildings, land titles, farm prices, taxes, and interest rates to land values; evaluation of appraisal methods and forms currently in use.
- 307. **AGRICULTURAL LAW (5).** Legal environment of agriculture. Recognition of legal problems associated with property ownership, contracts, torts, financing, estate planning and environmental controls and restrictions.
- 490. **SENIOR SEMINAR (1). LEC. 1.** Pr., senior standing. Pass-fail basis. Current developments in Agricultural Economics; the role of Agricultural Economics in the general economy.
- 499. **DIRECTED STUDIES IN AGRICULTURAL ECONOMICS (1-5).** Pr., COI, junior standing. Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research analysis of an employment experience or a combination. Employment experience with a variety of agribusiness and agencies may serve as the focus.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. **FARM MANAGEMENT (5).** Pr., AEC 202 or equivalent. Principles of economics applied to agriculture, uses of farm records to improve management of the farm, developing enterprise budgets and use in preparing a profit-maximizing farm plan.
- 503. **AGRICULTURAL PRICES (3).** Pr., AEC 202 or equivalent. Principles and factors in the pricing process with special reference to agricultural products and markets. Functions of prices and principles of supply and demand in price determination.
- 505. **AGRICULTURAL POLICY (3).** Pr., AEC 202 or equivalent. Concepts, objectives and operation of public policies affecting agriculture. Development of agricultural policies in the United States.
- 509. **RESOURCE ECONOMICS (5).** Pr., AEC 202 or equivalent. Principal economic and institutional factors affecting man and his use of land. Supply, demand, and future requirements for land. Property rights, land use planning, zoning, taxation and other social controls affecting land utilization.
- 510. **AGRICULTURAL BUSINESS MANAGEMENT (3).** Pr., AEC 202 or equivalent. Principles and problems in acquiring, organizing and operating successful agricultural businesses, capital requirements, factors affecting location and growth, and measures of technical and economic efficiency in organization and operation; practices in buying, pricing, and merchandising, management problems and policies in financing, personnel, and public relations.
- 512. **ECONOMIC ASPECTS OF WATER RESOURCES MANAGEMENT (5).** Supply, demand, and use of water resources including economic, legal, and political dimensions. Economics of management of water resource use and conservation in terms of present and future supplies and needs. Both public and private water resources will be considered.
- 560. **INTRODUCTION TO ECONOMETRICS (5).** Pr., MH 161 or equivalent, EC 274 or equivalent, and AEC 202 or equivalent. Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis.

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- 601. **ADVANCED FARM MANAGEMENT (5).** Advanced theory and application of farm management principles and economic concepts in agriculture. Organization, operation, and management of various types of farms. Optimum utilization of available resources on individual farms.
- 602. **ADVANCED AGRICULTURAL PRICES (5).** Pr., EC 274. Methods of price analysis, separation of fluctuations from price trends, measurement of changes in supply and demand of farm products. Prices, price trends, price cycles, and other price structures.
- 603. **ADVANCED LAND ECONOMICS (5).** Man and his use of land as related to institutional factors. Economics of natural resource use, economic feasibility, benefit-cost analysis, economics of environmental control, and factors related to rural and urban land use.
- 605. **ADVANCED AGRICULTURAL MARKETING (5).** Theory of marketing with emphasis on its application to methods used and problems faced in marketing farm products. Objectives in agricultural marketing.
- 606. **ECONOMICS OF AGRICULTURAL PRODUCTION (5).** Pr., EC 551. Resource allocation and efficiency of production. Production and efficiency in the firm, between firms, and between agriculture and other industries. Influences on agricultural resource allocation and efficiency of risk and uncertainty.
- 610. **QUANTITATIVE RESEARCH TECHNIQUES IN AGRICULTURAL ECONOMICS (5).** Introduction to basic quantitative techniques with emphasis on linear programming and its extensions. Concepts of input-output analysis, Markov chain analysis, dynamic programming, inventory control, queuing processes, replacement and game theory are also introduced. General theoretical background and associated computational procedures are used for presentation of each technique.
- 611. **ECONOMIC DEVELOPMENT (5).** Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis of financial and technical aid to other countries and case studies of development problems will be incorporated.
- 615. **RESOURCE ECONOMICS, POLICIES AND PROGRAMS (5).** Impact of resource development on economic growth. Effect of taxation and tax policies. Interaction between technological change, resource use, and economic growth. Analysis of current policies and programs.

- 620. **DIRECTED READINGS IN REGIONAL PLANNING (5).** Assigned readings and pursuant discussions on delineation of economic areas, resource use and allocation, economic regions, watershed development, planning legislation, zoning, housing, land use restrictions, conservation, and recreation.
- 621. **REGIONAL PLANNING ANALYSIS (5).** Theories of regions and problems of multi-jurisdictional planning. Analysis of metro-area and regional planning by states. Comprehensive planning by agencies such as TVA, Corps of Engineers, and Appalachian Regional Commission. Regional planning and intergovernmental relations.
- 625. **ECONOMICS OF AQUACULTURE (5).** Pr., AEC 202 or COI. Theory and application of economic principles of production, marketing, and consumption applied to aquaculture. Role of aquaculture in economic development.
- 670. **RESEARCH METHODS IN AGRICULTURAL ECONOMICS (3).**
- 680. **SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. CREDIT TO BE ARRANGED.**
- 690. **SEMINAR (1-1-1). FALL, WINTER, SPRING.**
- 699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

RURAL SOCIOLOGY (RSY)

- 261. **RURAL SOCIOLOGY (5).** Basic sociological concepts and principles as applied to life in the rural community. Special attention given to the culture, social organization, and social problems of rural people in the United States, and in the South in particular. Credit not allowed in this course and SY 201.
- 362. **COMMUNITY ORGANIZATION (5).** General elective. Understanding the principles of community organization and effective citizenship. Survey of institutions, organizations, and agencies interacting to meet community needs.
- 370. **METHODS OF SOCIAL RESEARCH (5).** Pr., RSY 261 or SY 201. Principal methods of data collection and analysis in sociological research.
- 499. **DIRECTED STUDIES IN RURAL SOCIOLOGY (1-5).** Pr., COI, junior standing. Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. May be used to complement and expand on an employment experience.

ADVANCED UNDERGRADUATE AND GRADUATE

- 541. **EXTENSION PROGRAMS AND METHODS (5).** An in-depth consideration of extension orientation in adult and continuing education in U.S. and developing nations. The Cooperative Extension Service is analyzed as an educational institution. Fundamental steps in program development and evaluation.
- 561. **RURAL SOCIAL ORGANIZATION (5).** Pr., RSY 261 or SY 201. Nature of rural social organizations with emphasis on their structure, function and change. Extent to which organizations meet needs of rural people and principles of improving effectiveness.
- 562. **SOCIOLOGY OF COMMUNITY DEVELOPMENT (5).** Pr., RSY 261 or SY 201. Various approaches to development of human resources and planning of changes within the total community. Development in different types of communities in the U.S. and world is considered with emphasis on small population centers.
- 565. **SOCIOLOGY OF NATURAL RESOURCES AND THE ENVIRONMENT (3).** Interaction between people's attitudes, behaviors and social relationships, and the natural environment. Related topics include human ecology, agriculture and the environment, social behavior in outdoor recreation settings, energy and social structure, social impact assessment, and the social organization of environmental management.

GRADUATE

- 561. **SOCIOLOGY OF REGIONS (3).** Social and demographic phenomena having implication for regional planning and development with emphasis on Southern region and subregions. Intra and inter-regional influences, socio-cultural structure, value orientations, population, changes and trends, and metropolitanization.
- 662. **SOCIAL SYSTEMS AND COMMUNITIES (3).** Interrelationship of institutions and organizations within the community and to large societal systems—regional and national. Emphasis on small towns and metropolitan centers relative to planning community change.
- 670. **RESEARCH METHODS IN SOCIOLOGY (5).**
- 680. **SPECIAL PROBLEMS IN RURAL SOCIOLOGY. CREDIT TO BE ARRANGED.**
- 699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Agricultural Engineering (AN)

Professors Turnquist, *Head*, Johnson, and Renoll
Associate Professors Busch, Hill, Koon, and Rochester
Assistant Professor Flood
Adjunct Professor Gill
Adjunct Associate Professors Hendrick, Reaves, Schafer, and Taylor

Courses For Majors

101. **INTRODUCTION TO AGRICULTURAL ENGINEERING (2). LEC. 1, LAB. 3.** Perspectives on the agricultural engineering profession, attaining professional status and the engineer's approach to problem solving. Emphasis on basic quantities used in physical systems.
102. **AGRICULTURAL ENGINEERING PRINCIPLES (2). LEC. 1, LAB. 3.** Engineering concepts and principles applied to agricultural problems. Evaluation and analysis of engineering problems, data acquisition, engineering measurement and notation, and conceptual design.
301. **MECHANICS OF FARM MACHINES (3). LEC. 2, LAB. 3.** Pr., ME 321, MH 265, IE 204. Basic concepts and engineering principles of farm machinery, including basic design, power needs and their measurement, functional and economic analysis, utilization and management, testing, and safety as related to farm machines.
302. **MECHANICS OF TRACTOR POWER (3). LEC. 2, LAB. 3.** Pr., MH 265, ME 301, 321, IE 204. Basic concepts and engineering principles of the farm tractor, including mechanics of the tractor, stability, traction, weight transfer, thermal efficiency, energy sources, economics, safety, testing and power measurement as related to tractors and power units.
303. **SOIL AND WATER ENGINEERING I (3). LEC. 3.** Pr. or Coreq., IE 204 and ME 340. Coreq., AN 303L. Rainfall-runoff relationships. Soil erosion mechanics and control methods. Upstream flood control analysis and design.
- 303L. **SOIL AND WATER ENGINEERING I LAB (1). LAB 3.** Coreq., AN 303. Surveying procedures and applications to soil and water problems including observation and design of conservation structures.
304. **DRAINAGE AND IRRIGATION ENGINEERING (3). LEC. 2, LAB. 3.** Pr., AN 303. Soil-water-plant relationships. Theory and design of drainage systems. Irrigation systems design. Water quality and supply. Legal and economic aspects.
305. **AGRICULTURAL PROCESSING ENGINEERING (3). LEC. 3.** Pr., ME 301, 340. Introduction to process engineering, fundamental concepts, theory of unit operations such as pumps, fans, size reduction, cleaning, bulk movement, and heat transfer and mass transfer.
306. **ELECTRICAL SYSTEMS IN AGRICULTURE (3). LEC. 3.** Pr., EE 261, Coreq., EE 263. Application of electrical power, equipment and control devices to agricultural systems. Special emphasis on safe and efficient power distribution, motor selection and performance, and theory and performance of sensing and control devices.
307. **AGRICULTURAL STRUCTURES DESIGN I (3). LEC. 2, LAB. 3.** Pr., ME 207. Analysis and design of structural systems of agriculture.
- 410-411. **SPECIAL PROBLEMS (3-3).** Pr., faculty adviser approval and AN 301-307. Individual student endeavor supervised by instructor involving special Agricultural Engineering topics to which the engineering electives selected by the student will be complementary.

Courses For Non-Majors

350. **SOIL AND WATER TECHNOLOGY (5). LEC. 4, LAB. 3.** Technical application of soil and water resources management. Irrigation system planning and equipment selection.
351. **AGRICULTURAL MACHINERY TECHNOLOGY (5). LEC. 4, LAB. 3.** Agricultural machinery; utilization, management, selection, and economic justification.
352. **TRACTOR AND ENGINE TECHNOLOGY (5). LEC. 4, LAB. 3.** Tractors and engines. Operation, fuels used, size selection, utilization, and economic justification.
353. **FARM BUILDING TECHNOLOGY (5). LEC. 4, LAB. 3.** Selection of materials, methods of construction and functional needs of modern farm buildings.
354. **AGRICULTURAL PROCESSING TECHNOLOGY (5). LEC. 4, LAB. 3.** Agricultural processing systems; includes storing, drying, pelleting, mixing and automatic materials handling systems.
355. **PRINCIPLES OF FOOD ENGINEERING TECHNOLOGY (5). LEC. 4, LAB. 3.** Engineering concepts and unit operations used in processing and handling of food products.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **AGRICULTURAL POWER AND MACHINERY DESIGN (3). LEC. 2, LAB. 3.** Pr., AN 301, 302. Design of equipment and systems to apply engineering principles to solutions of agricultural power and machinery problems. Functional requirements, safety, reliability, service conditions, power measurement, useful life, and creative design are combined to obtain designs for agricultural machine and power units.

503. **SOIL AND WATER ENGINEERING II (3). LEC. 2, LAB. 3.** Pr., AN 304. Small watershed hydrology. Open channel hydraulics applied to the design of irrigation, drainage, and erosion control facilities. Hydraulic design of conduits, and stilling basins.
505. **ELECTRICAL AND PROCESSING SYSTEMS DESIGN (3). LEC. 3.** Pr., AN 305, 306. Design and layout of material handling systems, fundamental theory of particle movement, study of sensing and feed-back systems to include automatic controls and servo-mechanisms.
507. **AGRICULTURAL STRUCTURES DESIGN II (3). LEC. 3.** Pr., AN 307. Functional requirements and design of animal shelters and agricultural storage buildings.
532. **ENGINEERING IN AGRICULTURE I—AGRICULTURAL MACHINERY (3). LEC.-DEM. 4.** Pr., graduate standing. The utilization of modern agricultural machinery on the farm with emphasis on safety, management, costs, economic justification, and principles of operation.
534. **ENGINEERING IN AGRICULTURE II—AGRICULTURAL POWER (3). LEC.-DEM. 4.** Pr., graduate standing. Farm tractor and power units used on the farm; includes the basic principles of operation with major interest toward lubrication, costs, operational problems, safety and a comparison of gasoline, Diesel, and LP gas fuels, and units.

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601. **ADVANCED SMALL WATERSHED HYDROLOGY (4).** Pr., AN 503, CE 512. Hydrograph synthesis. Mathematical modeling of runoff and streamflow. Probability analysis of hydraulic events. Design of upstream systems for flood and erosion control and water supply.
602. **ADVANCED FARM POWER AND MACHINERY (5).** Pr., AN 501. Principles of operation and analysis of design of basic machine elements, hydraulic systems and functional requirements of farm power units, agricultural machinery and materials of construction.
604. **AGRICULTURAL ENGINEERING PROBLEMS. CREDIT TO BE ARRANGED NOT TO EXCEED A TOTAL OF 5 HOURS.** Special advanced engineering and design problems.
605. **SOIL DYNAMICS OF TILLAGE AND TRACTION (3).** Pr., AY 555. COI. Analysis and measurements of soil reactions, as affected by the physical properties of the soil, when subjected to forces imposed by tillage implements and traction devices. Considered are shear, cohesion, adhesion, consolidation, plasticity and abrasion soil properties.
607. **ENGINEERING PRINCIPLES OF ANIMAL ENVIRONMENT (3). LEC. 3.** Pr., AN 507 or COI. Design and analysis of environmental equipment and systems for control or modification of animal production. Emphasis on evaluation of environmental factors which influence total environment.
608. **SEMINAR. CREDIT TO BE ARRANGED.** Reviews and discussions of research techniques, current scientific literature and recent developments in agricultural engineering research.
610. **BIOLOGICAL AND PHYSICAL SYSTEM ANALYSIS I (3).** Pr. MH 362. Mathematical analysis of biological and physical systems including the formulation of differential equations with analytical and numerical solution techniques. Solutions by regression equations and by physical models. Decisions made under certainty, risk and uncertainty.
611. **BIOLOGICAL AND PHYSICAL SYSTEM ANALYSIS II (3).** Pr., AN 610. A continuation of AN 610.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
799. **DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Agronomy and Soils (AY)

Professors Ward, Head, Adams, Buchanan, Cope, Donnelly, Hajek,
Hiltbold, Hood, Hoveland, Johnson, and King
Associate Professors Dickens, and C. Evans
Assistant Professors Bock, Dane, Haaland, Odom, and Walker

200. **CROP PRODUCTION (5). LEC. 4, LAB. 2.** Winter. Production of crops used by man for food, feed and fiber including identification of crop plants, cultural practices, and processing.
301. **PRINCIPLES OF GRAIN PRODUCTION (5). LEC. 4, LAB. 2.** Winter, Spring. Fundamental factors involved in the economic production of corn, small grains, grain sorghum, peanuts and soybeans.
304. **GENERAL SOILS (5). LEC. 4, LAB. 2.** Pr., CH 105 and 105L or CH 207. Winter, Spring. The formation, classification, composition, properties, management, fertility, and conservation of soils in relation to the growth of plants.
305. **GENERAL SOILS (5). LEC. 4, LAB. 2.** Pr., CH 103-104. Winter. The formation, classification, composition and properties of soils and their influence on vegetative growth and development on forest lands. Open only to students in Forestry.
307. **GENERAL SOILS (5). LEC. 4, LAB. 2.** Pr., CH 103-104. Fall, Spring. The general field of soils including genesis, classification and fertility.

310. **EARTH SCIENCE (5).** Materials of the earth; forces that shape and sculpture the earth's surface, including weathering, water, soil formation and erosion; soil geography; and historical geology. (Not open to students in School of Agriculture. Credit toward degree may not be earned in both this course and a General Soils course.)
312. **PRINCIPLES OF WEED SCIENCE (5).** LEC. 4, LAB. 2. Pr., BI 102 and CH 104. Fall. Basic weed identification and biology, methods of weed management, and classification of herbicides and how they are used in weed control.
315. **TURFGRASS MANAGEMENT (5).** LEC. 3, LAB. 4. Pr., BY 102. Fall. The management of recreational and home area turfgrass will be studied and will include the establishment and maintenance of turf and the effect of light, traffic, soil fertility, and water on its growth.
321. **MODE OF ACTION AND FATE OF HERBICIDES IN PLANTS AND SOILS (3).** LEC. 2, LAB. 3. Pr., BI 101-102, CH 207 or equivalent. Herbicide absorption, translocation by plants and effects on plant processes. Behavior of herbicides in soils and effects on soil microorganisms. Mechanisms of herbicide inactivation and the basis for herbicide selectivity.
399. **PROBLEMS IN WEED SCIENCE (1).** LEC. 1. Pr., COL. Fall. Conferences, problems, and assigned reading in weed science.
401. **PRINCIPLES OF FORAGE PRODUCTION (5).** LEC. 4, LAB. 2. Pr., junior standing. Fall, Spring. Grass and legume forage crops. The crops are considered from the standpoint of (a) pasture crops, (b) hay and silage crops, (c) soil improving crops.
403. **PESTICIDES (5).** LEC. 4, LAB. 3. Pr., CH 207. Winter. The chemistry, mode of action, activity, formulations, applications, and legal aspects of pesticides and pesticide applications.
404. **FIBER AND OIL CROPS (5).** LEC. 5. Pr., junior standing. Winter. Most of the time will be devoted to cotton, soybeans and peanuts with a limited amount of time devoted to other fiber and oil crops.
407. **CONCEPTS OF PEST MANAGEMENT (5).** LEC. 4, LAB. 3. Pr., COL. Fall. Pest management technology and philosophy.
420. **SOIL JUDGING (3).** LEC. 1 LAB. 4. Pr., AY 304, 305, or 307. Description, evaluation and interpretation of soil profile characteristics.
422. **FACTORS LIMITING CROP PRODUCTION (3).** LEC. 3. Winter. Factors influencing the production of crops including climate, water, soils. The role of plant and animal pests and the limitations created by the attitudes and mores of people.
430. **SOIL CHEMISTRY (5).** LEC. 3, LAB. 4. Pr., AY 304, 305, or 307. Winter. An introduction to the basic soil chemical properties of mineral composition, weathering, adsorption, ion exchange, acidity, alkalinity, salinity, and soil reactions with fertilizers, pesticides, and heavy metals.
455. **SOIL PHYSICS (5).** Pr., AY 304. Fall. Lecturers and demonstrations to illustrate fundamental physical properties of soils.
499. **SPECIAL PROBLEMS (1-5). CREDIT TO BE ARRANGED.** Pr., departmental approval, junior standing. Not open to graduate students. Students will work under the direction of a staff member on special problems in crop or soil science.

ADVANCED UNDERGRADUATE AND GRADUATE

502. **SOIL FERTILITY (5).** LEC. 5. Pr., AY 304, 305 or 307. Spring. Lectures, demonstrations and problems illustrate principles of soil fertility as related to fertilizer practices and crop production. An advanced course, required of all students majoring in Agronomy and Soils. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
506. **FERTILIZERS AND SOIL TESTING (5).** LEC. 4, LAB. 2. Pr., AY 304, 305 or 307. Winter. Manufacture and properties of fertilizer materials; properties and formulation of fertilizer mixtures; relative efficiency of various plant nutrient sources; principles and methods of soil testing and plant tissue testing.
507. **SOIL MANAGEMENT (5).** LEC. 5. Pr., AY 304, 305, or 307. Summer. Physical, chemical and biological properties of soils and their management. An advanced course designed for students in Agricultural Education. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
508. **SOIL RESOURCES AND CONSERVATION (5).** LEC. 4, LAB. 2. Pr., AY 304, 305 or 307. Fall. Soils as a natural resource for land-use planning; their classification and management for crop production, recreation, and urban and industrial development.
509. **SEED PRODUCTION (3).** Pr., AY 201, or 401. Spring, odd years. Methods and factors affecting production, storage, and processing seed.
510. **METHODS OF PLANT BREEDING (5).** LEC. 4, LAB. 2. Pr., ZY 300. Fall, even years. A general course in the principles and methods of plant breeding.
514. **PRINCIPLES AND USE OF HERBICIDES IN CROP PRODUCTION (5).** LEC. 4, LAB. 2. Pr., CH 104. Fall. Principles and use of herbicides in agronomic crops. Acquaints the students with methods of application including equipment, time of application, methods of incorporation and formulation of herbicides. The fate of herbicides in soil and the ecological impact on succeeding plant species.
515. **SOIL MORPHOLOGY (5).** LEC. 3, LAB. 4. Pr., AY 304, 305 or 307. Spring. Physical, chemical and mineralogical properties of soils are studied in relation to their classification for engineering and agricultural uses.

516. **ADVANCED TURFGRASS MANAGEMENT (5).** Pr., AY 304, 315, BY 306. Spring, even years. Factors affecting the grass plant as a component of a dynamic turf community, influence of soil chemical and physical conditions, management practices and climate will be discussed. Both theoretical and practical aspects of turf cultural practices will be discussed along with design and construction of athletic turf areas.
517. **CROP QUALITY (5) LEC. 5.** Pr., AY 201, or 401. Spring. Quality of food, feed and fiber crops as regulated by genetic potentials, environment, management and utilization.

GRADUATE

601. **AGRONOMY PROBLEMS (1-5). CREDIT TO BE ARRANGED.** Conferences, problems, and assigned reading in soils and crops, including results of agronomic research from the substations and experiment fields.
606. **SOIL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., AY 502 and BY 300. Spring, odd years. Soil microorganisms and their physiological processes related to soil development and plant nutrition. The role of microorganisms affecting the chemical and physical properties of soils will be studied, with emphasis on the cyclical transformations of nitrogen, phosphorus, carbon, and sulfur.
608. **EXPERIMENTAL METHODS (5).** Fall, even years. Experimentation in the agricultural sciences including experimental techniques, interpretation of research data, use of library references and preparation of publications; and consists of problems, assigned readings, and lectures.
615. **SEMINAR IN GENETICS (1).** Pr., ZY 300. Reports by students and staff members on current research and the literature in the field of genetics.
616. **ADVANCED PLANT BREEDING (5). LEC. 4, LAB. 2.** Pr., ZY 300. Winter, even years. Principles, methods, and techniques involved in plant breeding. Laboratory work will consist of studying active plant breeding programs, studying pollination techniques, and making pollinations. A term paper will be required.
617. **EXPERIMENTAL EVOLUTION (5).** Pr., ZY 300 and AY 616. Spring, even years. The factors affecting the evolution of species.
618. **CROP ECOLOGY (5).** Pr. BY 306 or ADS 204. Winter, even years. World population and food production problems. Origin, distribution and adaptation of crop plants as influenced by environment with emphasis on climatic factors. Lectures and reading from current literature.
619. **ADVANCED FORAGE CROPS MANAGEMENT (5). LEC. 3, LAB. 4.** Pr., AY 401 and BY 306 or ADS 204. Winter, odd years. Principles involved in successful establishment, maintenance, and management of crops used for grazing, hay and silage. Several field trips will be made to research stations and private farms to observe management practices.
625. **CROP PHYSIOLOGY (5). LEC. 4, LAB. 2.** Pr. BY 306, CH 208. Winter, odd years. Principles of plant physiology as related to crop yield. Current crop physiological research discussed emphasizing methods of investigation and interpretation of results.
654. **ADVANCED SOIL FERTILITY (5).** Pr., AY 502. Spring, even years. Composition, properties and management of soils in relation to the nutrition and growth of plants.
655. **SOIL AND PLANT ANALYSIS (5). LEC. 2, LAB. 6.** Pr., CH 206 and AY 502. Winter, odd years. Principles, methods, and techniques of quantitative chemical analysis of soils and plants applicable to soil science.
656. **SOIL CLAY MINERALOGY (5). LEC. 4, LAB. 2.** Fall, even years. Crystal structure and properties of the important clay size minerals of soils and clay deposits combined with identification techniques involving X-ray diffraction and spectroscopy, differential thermal analysis, electron microscopy, specific surface analysis, and infrared absorption.
657. **ADVANCED SOIL CHEMISTRY (5).** Pr., CH 507 and AY 430. Fall, odd years. Interpretation of soil properties and chemical reactions in terms of ion exchange, solubility diagrams, solution equilibria, electrochemistry, and electrokinetics of charged particles.
658. **ADVANCED SOIL PHYSICS (5).** Pr., MH 163, PS 205-206, and AY 555. Transport phenomena in soils. Physical principles and analysis of the storage and movement of water, solutes, heat, and gases in soils.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Research and thesis on problems related to crop production, plant breeding, soil fertility and soil chemistry.
799. **DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Animal and Dairy Sciences (ADS)

Professor Warren, *Head*, Anthony, Cannon, Harris, Hawkins, Huffman,
Parks, Patterson, Smith, Strength, and Wiggins
Associate Professors Daron, Kuhlers, Marple, McCaskey, Rollins, and Tucker
Assistant Professors Prince, Schmidt, and Thomas
Instructors Cordray and Woodburn

101. **MAN'S FOOD (3). LEC. 3.** Fall, Winter, Spring. Analysis of the world food supply; problems of food availability and distribution; methods of alleviating food shortages; role of the food processor.

200. **INTRODUCTORY ANIMAL AND DAIRY SCIENCES (5). LEC. 4, LAB. 2.** Fall, Winter, Spring. Provides some understanding of the scope and importance of the field. The importance of livestock to agriculture and to the nutrition of people. Livestock terminology, species characteristics, market classes and grades, marketing, the packing industry.
201. **INTRODUCTORY FOOD SCIENCE AND TECHNOLOGY (5).** Fall. The nature of the principal food industries; applications of chemistry and microbiology in food processing technology.
204. **ANIMAL BIOCHEMISTRY AND NUTRITION (5).** Pr., CH 104. Fall, Winter, Spring. Principles of animal biochemistry and nutrition and a study of nutrients and their utilization by animals.
209. **HORSE PRODUCTION (3). LEC. 2, LAB. 2.** Spring. Selection, breeding, feeding, management and use of horses in the Southeast.
210. **INTRODUCTORY MEAT SCIENCE AND TECHNOLOGY (4). LEC. 2, LAB. 4.** Fall, Winter. Theory and practice of slaughtering and cutting, identification and uses of meats.
301. **LIVESTOCK JUDGING (3). LEC. 1, LAB. 4.** Pr., ADS 200, junior standing. Fall, Spring. Theory and practice in the selection of beef cattle, swine, sheep and horses.
302. **FEEDS AND FEEDING (4). LEC. 3, LAB. 2.** Pr., ADS 204. Fall, Winter, Spring. Principles and practices of balancing and compounding of rations for beef and dairy cattle, horses, sheep, and swine.
305. **MEAT SELECTION AND GRADING (2). LEC. 1, LAB. 2.** Pr., ADS 210.
309. **LIVE ANIMAL AND CARCASS EVALUATION (3). LEC. 1, LAB. 4.** Pr., ADS 200, 210. Winter, Spring. Classifying and grading market hogs, cattle and sheep with major emphasis on indicators of carcass merit. Carcass grading, yield grading and evaluation.
312. **DAIRY FOOD PROCESSING (3). LEC. 2, LAB. 2.** Fall. Product standards and identity. Basic operations in the processing of dairy foods. Methods of quality assurance.
314. **DAIRY CATTLE JUDGING (3). LEC. 1, LAB. 4.** Pr., ADS 200. Theory and practice in the selection of dairy cattle.
407. **ADVANCED LIVESTOCK JUDGING (3). LEC. 1, LAB. 4.** Pr., ADS 301, COI. Fall. An advanced course in the selection and grading of livestock.
420. **UNDERGRADUATE SEMINAR (1).** Pr., senior standing. Winter. Lectures, discussions and literature reviews by staff, students and guest lecturers.
422. **ANIMAL DISEASE CONTROL (5).** Pr., BY 300 and ZY 251 or equivalent. Spring. Etiology, prevention and control of the important diseases of farm animals.
490. **SPECIAL PROBLEMS (1-5). CREDIT TO BE ARRANGED.** Pr., departmental approval, senior standing. Not open to graduate students. Students will work under the direction of staff members on specific problems.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **SWINE PRODUCTION (5). LEC. 4, LAB. 2.** Pr., ADS 200, 204. Fall, Spring. Practical problems involved in the breeding, feeding, and management of swine for economic production.
502. **BEEF CATTLE PRODUCTION (5). LEC. 4, LAB. 2.** Pr., ADS 200, 204. Fall, Winter. Practical phases of breeding, feeding, and management of beef cattle for economic production.
503. **ANIMAL BREEDING (5). LEC. 4, LAB. 2.** Pr., ZY 300. Fall, Spring. Application of genetic principles to the breeding of cattle, sheep, and swine. Studies of different systems of breeding and selection and their related efficiencies for livestock improvement.
504. **DAIRY CATTLE PRODUCTION (5). LEC. 4, LAB. 2.** Pr., ADS 200, 204. Spring. Practical phases of breeding, feeding and management of dairy cattle for economic production.
505. **PHYSIOLOGY OF LACTATION (5). LEC. 4, LAB. 2.** Pr., departmental approval. Spring. Anatomy and physiology of milk secretion; milk precursors; factors affecting composition of milk.
506. **ANIMAL REPRODUCTION (5). LEC. 4, LAB. 2.** Pr., ZY 251 or equivalent. Winter. Anatomy and physiology of the male and female reproductive tract; hormones; estrus and estrual cycle; ovulation, mating, gestation, parturition; sperm physiology; collection, storage and dilution of semen; artificial insemination; fertility; sterility; pregnancy tests.
508. **ADVANCED ANIMAL NUTRITION (5). LEC. 4, LAB. 2.** Pr., ADS 204, 302. Winter, Spring. Animal nutrition and application to the production of farm animals, including physiology of nutrition, metabolism of nutrients and recent nutritional developments.
509. **PHYSIOLOGY OF GROWTH (3).** Pr., ADS 508. Factors influencing growth and body composition; genetic, social environment, feed intake, climate, growth regulators and metabolic rate.
510. **MEAT TECHNOLOGY (4). LEC. 2, LAB. 4.** ADS 210. Meat curing and processing procedures and the biochemical alterations of meat during aging, curing and processing.
512. **FROZEN AND CONCENTRATED DAIRY FOODS (3). LEC. 2, LAB. 2.** Pr., ADS 312. Specialized techniques in the processing and handling of frozen and concentrated dairy foods.
513. **FERMENTED DAIRY FOODS (3). LEC. 2, LAB. 2.** Pr., ADS 312. Bacterial culture handling, processing and curing of cheese varieties, processing and handling cultured milk products.
514. **FOOD MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 300. Relationship of habitat to the occurrence of microorganisms on food; environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation bacteriology.

515. **FOOD PLANT SANITATION (3). LEC. 2, LAB. 2.** Sanitary regulations of food plants. Principles and procedures of cleaning and sanitizing food handling equipment.
516. **ADVANCED MEAT SCIENCE AND MUSCLE BIOLOGY (4). LEC. 3, LAB. 3.** Pr., ADS 210 or equivalent. Spring. Composition of meat; muscle microanatomy, biochemical and physiological aspects of muscle contraction; muscle physiology and meat quality.
518. **BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 208. Classification, structure and chemistry of the major chemical constituents of living matter. (Same course as CH 518.)
519. **BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., ADS 518 or equivalent. Introduction to metabolism. (Same course as CH 519.)

GRADUATE

(Graduate Standing Required)

600. **MUSCLE PHYSIOLOGY AND BIOCHEMISTRY (3).** Pr., ADS 516, 518 or equivalent. Biology of muscle growth and metabolism and the post-mortem phenomena associated with the conversion of muscle to meat.
607. **COMPARATIVE ANIMAL NUTRITION (3).** Pr., ADS 508. Fall. Comparative nutritional requirements in beef and dairy cattle, sheep, swine and laboratory animals.
608. **ADVANCED ANIMAL REPRODUCTION (5).** Pr., ADS 506, ZY 524. Physiology and endocrinology of reproduction.
611. **SEMINAR. CREDIT TO BE ARRANGED.**
612. **GENETICS OF POPULATIONS (5).** Pr., ADS 503. Genetic composition of populations and factors affecting rates of change and conditions of equilibrium.
613. **ADVANCED ANIMAL BREEDING (5).** Pr., ADS 612 and BY 601. Statistical tools and methodology used in animal breeding theory and research. Criteria of selection, methods of selection, evaluation of breeds and application to the animal industry.
614. **MINERALS AND VITAMINS (5).** Pr., ADS 519 and ZY 524. Specific functions of minerals and vitamins in animal metabolism.
615. **RUMINANT NUTRITION (5).** Pr., ZY 524 and ADS 519. Rumen fermentation and the biochemistry of ruminant metabolism.
617. **MICROBIAL BIOCHEMISTRY (5).** Pr., 5 hours of microbiology and ADS 519. Anatomy, growth and metabolism of the bacterial cell with emphasis on the biochemical makeup of the cell and the regulation of its activities.
619. **EXPERIMENTAL METHODS (5).** Pr., satisfactory courses in biological statistics. Research methods in the animal sciences including design of experiments, experimental techniques, analysis and interpretation of data, evaluation of research literature and preparation of publications.
641. **PROTEINS (5).** Pr., ADS 519 or equivalent. Chemical and physical properties of amino acids and proteins, protein structures, and the relation of protein structure to function. (Same course as CH 641.)
642. **LIPIDS (5).** Pr., ADS 519 or equivalent. Chemistry of the lipids and their biological significance. (Same course as CH 642.)
643. **ENZYMES (5).** Pr., ADS 519 or equivalent. The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes; classification of enzymes; and enzyme formation.
644. **TOPICS IN BIOCHEMISTRY (2-6 HRS. CREDIT—TO BE ARRANGED).** Pr., ADS 519, or equivalent and COI. (Same course as CH 644.) Selected areas of metabolism and the techniques for characterization of macromolecules.
645. **BIOCHEMICAL RESEARCH TECHNIQUES (5).** Pr., ADS 519 or its equivalent. Modern biochemical laboratory techniques. (Same course as CH 645.)
690. **SPECIAL PROBLEMS (1-5 HOURS. CREDIT TO BE ARRANGED.)** Conference problems, assigned reading and reports in one or more of the following major fields: (a) animal biochemistry and nutrition, (b) animal breeding and genetics, (c) physiology of reproduction, (d) animal production, (e) meats, and (f) dairy products.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Research and thesis may be on technical laboratory problems or on problems directly related to beef, cattle, dairy cattle, sheep or swine.
799. **DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Anthropology (ANT)

For listing of courses, see page 332.

Architecture (AR)

Professors Davis, Doerstling, Millman, McPheeters,
Snow, and Speer

Associate Professors Blackwell, Carter, Faust, Haire,
Hing, Meyer, Uthman, and Zwirn

Assistant Professors Baxley, Frank, Gwin, Howedy,
Hamilton, Jordan, Lundell, and Rowen

Instructors Froula and Wilson

Adjunct Associate Professor Latta

Architecture Program (AR)

- 110-111-112. DESIGN FUNDAMENTALS (5-5-5) LAB. 10-10-10.** Pr., acceptance into AR, ID or LA Curriculum. Architectural drawing and basic rendering and communication techniques. Elemental design concepts employing two and three dimensional experiments and study of historic precedents.
- 201-202-203. ARCHITECTURAL DESIGN (5-5-5). LEC. 2-2-2, LAB. 10-10-10.** Pr., AR 110, 111 and AR 112. Man and his needs as the primary influence in shaping space, form, and function; approach to a design methodology and understanding of structure.
- 261-262-263. HISTORY AND THEORY OF ARCHITECTURE (3-3-3).** Pr., 2nd year standing. Must be taken in sequence. The development of architecture from ancient times through contemporary examples. The cultural and social milieu, as well as the technology of each period will be investigated to better understand the basic determinants of architectural form. Composition of architectural space, will be considered. Illustrated lectures, readings, drawings, and reports.
- 301-302-303. ARCHITECTURAL DESIGN (5-5-5). LAB. 15-15-15.** Pr., AR 203, AR 263, MH 161, PS 205. Analysis and solution of building design problems of moderate complexity; emphasis on environmental considerations and introduction of building systems.
- 320. PHOTOGRAPHY I (3)** Pr., Open to AR, BSC, ID & LA only, COI. An exploration of the 35MM SLR camera in black and white photography for personal expression and as a tool for design.
- 321. PHOTOGRAPHY II (3).** Pr., AR 320, COI. Development of individual photographic skills and insights into understanding of surroundings.
- 350. 20TH CENTURY ARCHITECTURE (3).** Pr., AR 263. Philosophical and theoretical architectural concerns of the twentieth century. Classroom format, readings, lectures, discussions and written reports.
- 360. APPRECIATION OF ARCHITECTURE (3).** General elective. Pr., 2nd year standing. (Not open to AR, ID, and LA students.) Architectural development with particular attention to American and contemporary examples. Illustrated lectures, reading, essays.
- 370. SPACES FOR LIVING (3).** General elective. Pr., 3rd year standing. (Not open to AR, ID, and LA students.) Contemporary concepts of design, spatial organization, materials, furnishing, and gardens in relation to all major types of residential architecture. Illustrated lectures, readings, reports.
- 401. ARCHITECTURAL DESIGN (5). LAB. 15.** Pr., AR 303. Buildings of advanced complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.
- 402. ARCHITECTURAL DESIGN (5). LAB. 15.** Pr., AR 401, BSC 315, 453. Studio exercises deal primarily with design problems on a community scale and are conceived to facilitate the application of principles and techniques introduced in the prerequisite planning courses.
- 403. ARCHITECTURAL DESIGN (5).** Pr., AR 402. Buildings of advance complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.
- 435. PRESENTATION TECHNIQUES (3). LAB. 6.** Pr., 2nd year standing. Experience with graphic presentation of architectural subjects in various media with the objective of improving ability for more effective communication of design.
- 451. SEMINARS IN METHODS AND PROCESS (3).** Explorations of the tools and techniques available to the design professional. Complete descriptions of specific seminars available from the department.
- 452. SEMINARS IN CONTEMPORARY ISSUES (3).** Investigation of significant topics and issues that present opportunities and constraints to architectural thought and practice. Complete descriptions of specific seminars available from the department.
- 453. SEMINARS IN INTERDISCIPLINARY STUDIES (3).** Various disciplines that impinge upon the design of buildings, including natural and social sciences, technology, and humanistic studies. Complete descriptions of specific seminars available from the department.
- 456. SEMINARS IN HISTORICAL PERSPECTIVES (3).** Theories, schools, or periods with the intent of expanding awareness of critical attitudes toward both the potentials and limitations of architecture. Focus of individual seminars will range from ancient to post-modern architecture. Complete descriptions of specific seminars available from the department.

457. **SEMINARS IN ASPECTS OF DESIGN (3).** Detailed aspects of architectural design, such as form, space, style, meaning, imagery, or cultural context, with the intent of developing theoretical and analytical habits of thought. Complete descriptions of specific seminars available from the department.
458. **SEMINARS IN DISCIPLINES OF ENVIRONMENTAL DESIGN (3).** Related design fields to broaden appreciation of the range of concerns of the design professional. Complete descriptions of specific seminars available from the department.
- 465-466. **ARCHITECTURAL DESIGN (8-8). LAB. 16-16.** Pr., AR 403. Advanced problem solving processes and synthesis of previous design experiences; consideration of total scope of professional concerns, from architectural detailing to community design.
467. **ARCHITECTURAL DESIGN (8). LAB. 16.** Pr., AR 466, 499. The extensive development of an architectural problem of the student's choice, under direction of the Committee on Design. Drawings, models, details, and written explanations, oral and/or published presentation for jury consideration.
469. **LIGHTING (3). LECTURE 1, LAB. 2.** Pr., 3rd year standing. An introduction to lighting, principles and techniques as applied to design in architecture and interior design.
- 471-472. **PROFESSIONAL PRACTICE (3-3).** Pr., 5th year standing. Procedure in architectural practice; construction methods, estimation of quantities and costs. Office organization; legal requirements; professional organizations and relations; civic responsibility, professional ethics.
474. **INTRODUCTION TO URBAN PLANNING (3).** Pr., 4th year standing, AR 263. A survey of urban planning history and theory; an examination of the basic forces, influences and practices shaping urban growth and development.
475. **URBAN DESIGN (3).** Pr., AR 474. Case studies seminar illustrating the building processes that shape cities and urbanize regions and the role of architectural and related design professions within these processes.
481. **COMPUTERS IN ARCHITECTURE (3).** Pr., 3rd year standing. Survey of existing and emerging techniques of computer utilization in architectural design, production, and management.
485. **ARCHITECTURAL MANAGEMENT I (5).** Pr., 5th year standing. Coreq., AR 471, MN 241. Philosophies, issues, methods and procedures involved in the planning of architectural business operations, marketing of architectural services, management of architectural design processes. Lectures, case studies, research, problems.
486. **ARCHITECTURAL MANAGEMENT II (5).** Pr., AR 485. Coreq., MN 242. Continuation of AR 485. Philosophies, issues, methods and procedures involved in the management of architectural personnel, financial management of architectural operations, initiation of an independent architectural practice. Lectures, case studies, research, problems.
487. **ARCHITECTURAL MANAGEMENT THESIS (8).** Pr., AR 486. Special study of one or more topics, issues and/or problems significant to the management of modern architectural firms. Subject will be at the choice of the candidate and as approved by the Faculty Committee. Candidate must make documentary and oral presentations to staff and guest specialists and will also be expected to defend project.
495. **SPECIAL PROBLEMS. CREDIT TO BE ARRANGED UP TO 5 HRS.** Pr., 3rd year standing. Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the head of the Department. Evaluation of the work may be by faculty jury. May be taken more than one quarter. Maximum credit of 15 hours.
499. **DESIGN RESEARCH (2).** Pr., AR 465. The selection and comprehensive programming of a terminal problem in architecture to be executed in AR 467.

Interior Design (ID)

Courses specifically required in the Interior Design curriculum

215. **ELEMENTS OF INTERIOR DESIGN (3). LEC. 3.** Pr., AR 112. The profession of interior design including basic theory of interior design principles, aesthetics, and design concepts. Lectures, reading and discussions.
216. **ELEMENTS OF INTERIOR DESIGN (3). LEC. 1. LAB. 3.** Graphic drawing of interior spaces and related architectural design solutions. Lab projects involve development of delineation skills and techniques in graphic presentations.
217. **ELEMENTS OF INTERIOR DESIGN (3). LEC. 1. LAB. 3.** Basic drafting techniques and skills in relation to development of architectural working drawings required in the construction of interior spaces and equipment.
- 305-306-307. **INTERIOR DESIGN (5-5-5). LAB. 15-15-15.** Pr., AR 203. Admission upon recommendation of the Committee on Design. Analysis and solution of interiors of moderate complexity, with emphasis on domestic and commercial problems. Research, discussion, drawings, models.
- 365-366. **PERIOD INTERIORS (5-5).** Pr., AR 261, 262, and 263. The development of interior spaces, furniture, fabrics, and accessories from pre-Renaissance to 1900. Illustrated lectures, readings, reports, and field trips.
367. **CONTEMPORARY INTERIORS (5). LEC. 2.** Pr., ID 366. The fundamental aspects of interior design, spatial order and characteristics, furniture and fabric design, from 1900 to date. Illustrated lecture, readings, reports.
- 405-406. **INTERIOR DESIGN (5-5). LEC. 2-2. LAB. 9-9.** Pr., ID 307. Admission upon recommendation of the Committee on Design. Analysis and solution of interiors of advanced complexity, with emphasis on institutional and public problems. Research, discussions, drawings, models.
407. **INTERIOR DESIGN (7). LEC. 2. LAB. 15.** Pr., ID 406. The development of a major design problem under the direction of the Committee on Design. Drawings, models, details; oral presentation for jury consideration.

408. **INTERIOR DESIGN RESEARCH (2). LEC. 1, LAB. 3.** Coreq., ID 406. Selection and comprehensive programming of a terminal interior design problem to be executed in ID 407.
- 441-442. **PROFESSIONAL PRACTICE (3-3). LEC. 1, LAB. 3.** Office procedure and methods for interior designers; the techniques and execution of working drawings for buildings, cabinetry and interior details; specification. Discussions, drawings, inspections, reports.
495. **SPECIAL PROBLEMS. CREDIT TO BE ARRANGED UP TO 5 HRS.** Pr., 3rd year standing. Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the department head. Evaluation of the work will be by faculty jury. May be taken more than one quarter. Maximum credit: 15 hours.

Landscape Architecture (LA)

231. **INTRODUCTION TO LANDSCAPE ARCHITECTURE (3).** Pr., 2nd year standing. A survey of the art and practice of landscape architecture: its aims, scope and philosophy.
232. **DEVELOPMENT OF LANDSCAPE ARCHITECTURE I (3).** Pr., 2nd year standing. An historical analysis of man's progress in designing land and outdoor space to meet varying needs in different times and places. Emphasis on religious, economic, cultural, social and political conditions, topography and climate as style determinants. Landscape design from ancient times to the first quarter of the nineteenth century. Lectures and collateral reading.
233. **DEVELOPMENT OF LANDSCAPE ARCHITECTURE II (3).** Pr., 2nd year standing. An historical analysis in continuation of AR 232 but may be taken separately. The impact of technological advance on the design of outdoor space. The shift from private to public works and the development of landscape architecture as an instrument of service in the public welfare. Lectures and collateral reading.
- 321-322-323. **BASIC LANDSCAPE ARCHITECTURAL DESIGN (5-5-5). LAB. 15-15-15.** Pr., AR 203, CE 201, HF 222, HF 223, HF 321. Introduction to the analysis and organization of the basic components of the landscape, including spatial elements of earth, plants and structure; design of simple outdoor spaces as they relate to the natural and cultural environment; introduction to principles of planting composition; coordination with courses in landscape construction.
341. **LANDSCAPE CONSTRUCTION I (5). LAB. 15.** Pr., LA 321. Introduction to landscape construction with emphasis on interpretation of topography; problems in the development of land forms, and construction materials; simple site engineering.
342. **LANDSCAPE CONSTRUCTION II (5). LAB. 15.** Pr., LA 321. Coreq. LA 323. Advanced landscape construction and site engineering; preparation of working drawings, specifications and estimates. This course will run parallel to and may be combined with LA 322.
- 421-422-423. **INTERMEDIATE LANDSCAPE ARCHITECTURAL DESIGN (5-5-5). LAB. 15-15-15.** Pr., LA 322, LA 342. A continuation of third year landscape architectural design concepts and principles with increasingly difficult problems involving the total range of the physical environment.
431. **ADVANCED PLANT COMPOSITION (5). LAB. 15.** Pr., LA 421. A continuation of planting design incorporated in landscape design courses; emphasis on specific problems in respect to knowledge of plant characteristics and requirements in natural and man-made environments; preparation of planting plans and specifications.
446. **PROFESSIONAL PRACTICE I (5). LEC. 2, LAB. 9.** Pr., LA 422. Coreq. LA 423. Procedure in landscape architectural practice; preparation of working drawings, specifications, and estimates.
447. **PROFESSIONAL PRACTICE II (5).** Pr., LA 446. Office organization, legal requirements, professional organizations and relations, civic responsibility, professional ethics.
450. **DESIGN RESEARCH (2).** Pr., LA 451. Directed studies and research involving the selection and comprehensive programming of a terminal problem in landscape architecture to be undertaken in LA 453.
- 451-452. **ADVANCED LANDSCAPE ARCHITECTURAL DESIGN (8-8). LAB. 16-16.** Pr., LA 423. Advanced problem solving processes and synthesis of previous design experiences with application to the environmental problems of today. Consideration of the total scope of professional concerns with emphasis on problems at a regional scale and the team approach to design with allied professionals.
453. **ADVANCED LANDSCAPE ARCHITECTURAL DESIGN (8). LAB. 16.** Pr., LA 450, LA 452. The extensive development of a problem which, by its relative comprehensiveness, will serve as a final examination for the professional degree of Bachelor of Landscape Architecture.
455. **SEMINAR IN LANDSCAPE ARCHITECTURE (5).** Pr., 5th year standing. A special experimental seminar or independent study course intended to cover topics not treated by regular course offerings.
495. **SPECIAL PROBLEMS IN LANDSCAPE ARCHITECTURE (3).** Pr., 3rd year standing. Development on a tutorial basis of an area of special interest through independent study. This may be a group or team effort under the direction of the faculty and with prior approval of the Head of the Department. Evaluation of the work shall be by faculty jury. May be taken more than one quarter.

Regional Planning UNDERGRADUATE

463. **ENVIRONMENTAL DESIGN FOR PLANNERS (2-8).** Pr., COI. An introduction to the design and appreciation of the man-made environment. Includes a survey of architectural, landscape architectural and urban design theory and method designed to develop skills in these areas.
474. **INTRODUCTION TO PLANNING (3).** Pr., COI. A survey of planning history and theory; an examination of the basic forces, influences and practices shaping growth and development. Same as AR 474.

ADVANCED UNDERGRADUATES AND GRADUATES

507. **RESOURCES AND ENVIRONMENT (5).** An examination of the relationship between man and his physical environment emphasizing his use of natural resources and his impact on the land, sea and atmosphere. Same as GY 507.
522. **PLANNING AND ENVIRONMENTAL PERCEPTION (3).** Pr., RP 463 and RP 474 or COI. Analysis of human perception of the cultural, social and natural environments; the impacts of landscape alteration and their mitigation.
524. **PLANNING AND LAND DEVELOPMENT (5).** Pr., RP 474 or COI. Survey and analysis of the economic, legal, administrative, planning and design factors influencing the process of real estate development from the perspectives of developers, planners and consumers.
525. **SEMINAR IN HISTORIC PRESERVATION PLANNING (3).** Pr., COI. Local, state and national planning for the preservation, restoration, conservation and adaptive reuse of historic buildings and sites within the comprehensive planning process.
527. **SEMINAR IN CENTRAL BUSINESS DISTRICT REVITALIZATION (3).** Pr., RP 474 or COI. Review and analysis of the goals, principles, strategies and programs for restoring and revitalizing the CBDs of smaller communities with particular emphasis on physical building and reuse activities and their relationships to fiscal, administrative and private sector organization and commitment.
529. **PLANNING FOR RECREATION AND TOURISM (3).** Pr., COI. Introduction to the basic concepts and methods used in identifying and allocating recreation resources, the development of tourism and the preparation and implementation of tourism and recreation plans and programs.
530. **COMMUNITY AND REGIONAL ENERGY PLANNING (5).** Pr., COI. Introduction to the national and southeastern needs for the production and conservation of energy resources and the impact of energy development conservation and use. Special emphasis on the role of energy planning in the comprehensive planning process, with policy formulation for energy planning at the community and regional scale.
545. **SEMINAR IN RURAL AND COMMUNITY PLANNING (3).** Pr., RP 474 or COI. Consideration of the nature of rural areas and communities, the perspective, responsibility and performance of the planning professional and a critical appraisal of regional and community plans.
560. **DEVELOPMENT LOCATION ANALYSIS (5).** Pr., COI. Introduction to the location of economic activity and an analysis of site decision-making framework involving several types of developments. Same as GY 560.
564. **SITE PLANNING (5).** Pr., RP 463, or third year standing in Architecture or Landscape Architecture, COI. An introduction to the art of site planning, an exposition of its principles and application of its techniques with both large and small scale projects.
575. **SOCIAL WELFARE POLICY (5).** Pr., COI. Current problems, policy issues and proposals in selected social welfare problems are critically examined and evaluated. Same as SW 575.
596. **SPECIAL PROBLEMS IN PLANNING (1-5).** Pr., RP 474 and COI. Directed study in an area of special interest. Topic and credit to be arranged with advisor and approved by the chairman. May be repeated for a maximum of up to 10 quarter hours credit.

GRADUATE

601. **HISTORY AND THEORY OF PLANNING (5).** Pr., RP 474 or COI. The historical development of cities and regions. Particular emphasis on the interaction of their dynamic and structural elements. The impact of the planning process and planner on public policy and private decision-making is examined with a survey of the ethics, responsibility and professional practice of planners to assist students to develop a personal philosophy for their work as professionals.
602. **PLANNING STUDIO I (5).** Pr., RP 601 or COI. An introduction to the solution of a real-world comprehensive planning problem in cooperation with faculty and other professionals, public agencies and jurisdictions. Included will be the survey and analysis of available information, preparation of a study design and work program, review of environmental and technological constraints, investigation of community goals and values and development of draft alternative proposals.
603. **PLANNING STUDIO II (5).** Pr., RP 602 or COI. A continuation of 602. The preparation of draft land use and housing elements of a comprehensive plan with particular emphasis on their interrelationship with economic development, transportation, public facilities and the local and regional environment.

604. **PLANNING STUDIO III (5).** Pr., RP 603 or COI. A continuation of 603. The preparation of draft transportation and community facility elements of a comprehensive plan with emphasis on their interrelationships and impacts on community and regional form.
605. **PLANNING STUDIO IV (5).** Pr., RP 604 or COI. A continuation of 604. The preparation of a comprehensive plan implementation program, including the roles of the executive, legislative and judicial branches of government, grantsmanship and relationships with other governmental agencies and the private sector.
610. **COMMUNICATION FOR PLANNERS (3).** Cor., RP 601 or COI. Introduction to basic communication skills and equipment and the role of each. Graphics, audio-visuals, models and written communications projects in individual and team efforts.
611. **TRANSPORTATION PLANNING (3).** Pr., COI. The transportation planning process, trip generation, forecasting and assignment techniques: goal formulation and analysis of plans. Same as CE 611.
615. **CURRENT PLANNING ISSUES (3).** Pr., RP 601 or COI. Seminar examining topical issues in the fields of urban and regional planning.
618. **SEMINAR IN COASTAL ZONE PLANNING AND MANAGEMENT (3).** Pr., COI. Seminar in planning for the resolution of multiple use conflicts in the development and conservation of the coastal environment.
620. **URBAN PLANNING ANALYSIS (5).** Pr., RP 635 or CE 603 or COI. Field application and involvement at the city or neighborhood level; data collection and analysis; agency and program identification; problem definition and recommendation of strategic plan; emphasis on real-world problems with an actual client.
621. **REGIONAL PLANNING ANALYSIS (5).** Theories of regions and problems of multijurisdictional planning. Analysis of metro-area and regional planning by states. Comprehensive planning by agencies such as TVA, Corps of Engineers and Appalachian Regional Commission. Regional planning and intergovernmental relations. Same as AEC 621.
635. **PLANNING RESEARCH, ANALYSIS AND FORECASTING (5).** Pr., RP 601 or COI. Introduction to the variety of methods useful in the comprehensive planning process, with special emphasis on small communities and non-metropolitan regions. Emphasis is in survey and analysis, including population projections, migration, economic base, resource allocation, interrelationships between population and facilities/services needs, and the economic impact of development policy decisions.
640. **PLANNING LAW (5).** Pr., RP 601 or COI. Introduction to the legal base for local government, with special emphasis on the planning for and guiding the development and conservation of land and other resources, including police powers and eminent domain, zoning, subdivision regulations, permit systems and administrative review, health laws and housing and construction codes.
642. **PLANNING, ADMINISTRATION AND GOVERNMENT (3).** Pr., RP 601 or COI. Policymaking as a public process; planning powers and policy formulation. Identification and selection of goals, development of programs and measuring of performance. Concepts and operations of government and public services and facilities.
644. **PUBLIC SERVICES AND FISCAL POLICY (5).** Pr., COI. Supply and demand for public services, determinants of public policy programming, public financing, benefit/cost analysis, budgeting and fiscal policy.
698. **PLANNING SYNTHESIS (5).** Pr., RP 605 and COI following satisfactory completion of oral examination. The demonstration of competence by the production of an original work in planning. This is a terminal project in lieu of thesis and will include the integration of knowledge from previous courses and experience in a proposed solution to a complex regional, rural or community planning problem or project. The emphasis will be on the student's area of specialization and the comprehensive planning process.

Art (AT)

Professors Hiers, *Head*, Abney and Williams

Associate Professors Baggett, Hatfield, Hobbs, Olson, Ross, and Taugner

Assistant Professors Collier, Dugas, Furr, Hanger, Munday, Ozereko, Price, Shady, Walls, and Webb

Instructors Bogard, Ensminger and Mitchell

All studio courses require 10 hrs. contact with instructor and 5 hrs. of independent work.

111. **FUNDAMENTALS (5). STUDIO 15.** Mechanical linear perspective.
112. **FUNDAMENTALS (5). STUDIO 15.** Representational drawing. Linear construction, proportion, freehand perspective, chiaroscuro, surface treatments.
113. **FUNDAMENTALS (5). STUDIO 15.** Pr., AT 111, 112. Interpretive drawing. Emphasis on creativity, composition and pictorial organization.
121. **FUNDAMENTALS (5). STUDIO 15.** Plastic elements. Relationship of the arts. Problems in basic design.
122. **FUNDAMENTALS (5). STUDIO 15.** Basic three-dimensional organization. Clay and other media.
123. **FUNDAMENTALS (5). STUDIO 15.** Pr., AT 121, 122. Advanced application of principles encountered in AT 121 and AT 122.
171. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of the major movements and developments of Western art history from Paleolithic art through the Gothic age.

172. **HISTORY OF WORLD ART (3). LEC. 3.** A survey of Western art history from the Renaissance through Realism.
173. **HISTORY OF WORLD ART (3). LEC. 3** A survey of Western art history, art, and artists from Impressionism through contemporary art.
211. **BASIC FIGURE DRAWING (5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173. Open to VAT majors only. Drawing in various media emphasizing a subjective approach to the human figure as form and as a compositional element.
212. **FIGURE CONSTRUCTION (5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173. Open to VAT majors only. Lectures deal with form, function and operation of skeletal and muscular parts of the body. Drawing from casts, models, and skeleton.
213. **FIGURE DRAWING (5). STUDIO 15.** Pr., AT 211, 212. Open to VAT majors only. Drawing from the model in various media, with emphasis on construction, interpretation, and expression.
221. **GRAPHIC PROCESSES (5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173. Open to VAT majors only. Graphic reproduction processes, preparation of art copy for reproduction, copy fitting, paper, related subjects.
222. **DESIGN SYSTEMS (5). STUDIO 15.** Pr., AT 221. Design procedures for creative problem solving in areas of visual organization; emphasis on presentation and visualization of concepts.
223. **GRAPHIC FORMATS (5). STUDIO 15.** Pr., AT 221, 222. Applied problems in editorial and advertising layout. Emphasis on relationship of format to media.
- 231-331. **OIL PAINTING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 232-332. **TRANSPARENT WATER COLOR (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 233-333. **OPAQUE WATER COLOR (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 241-341. **RELIEF PRINTMAKING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 242-342. **INTAGLIO PRINTMAKING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 243-343. **PLANOGRAPHIC PRINTMAKING (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 251-351. **MODELING/CONSTRUCTION (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 252-352. **WOOD SCULPTURE (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
- 253-353. **STONE SCULPTURE (5-5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173.
301. **ELEMENTARY SCHOOL ART (5). LEC. 3, LAB. 6.** Pr., junior standing. Cannot be taken for credit by VAT majors. An introduction to design principles and elements. The theory of teaching art, methods and materials especially related to elementary school art.
321. **PHOTODESIGN (5). STUDIO 15.** Pr., AT 113, 123, 171, 172, 173. Open to VAT majors only. Technical aspects of equipment, materials and processing. Emphasis on aesthetic analysis. Historical development of photography as related to visual communications. Some special expense required.
322. **PHOTOCOMMUNICATION (5). STUDIO 15.** Pr., AT 221, 321. Photography as applied communication. Emphasis on advanced technical and studio techniques.
323. **TYPOGRAPHICS (5). STUDIO 15.** Pr., AT 221. Practical applications of typography in advertising, editorial, and other contemporary formats. Historical and anatomical development of type and letterforms.
371. **ANCIENT EGYPTIAN AND NEAR EASTERN ART (3). LEC. 3.** Pr., sophomore standing.
372. **ANCIENT GREEK AND ROMAN ART (3). LEC. 3.** Pr., sophomore standing.
373. **MEDIEVAL ART (3). LEC. 3.** Pr., sophomore standing.
374. **GOTHIC ART (3). LEC. 3.** Pr., sophomore standing.
375. **ITALIAN RENAISSANCE ART (3). LEC. 3.** Pr., sophomore standing.
376. **LATE RENAISSANCE AND MANNERIST ART (3). LEC. 3.** Pr., sophomore standing.
377. **BAROQUE AND ROCOCO ART (3). LEC. 3.** Pr., sophomore standing.
378. **EARLY MODERN ART (3). LEC. 3.** Pr., sophomore standing.
379. **LATE MODERN ART (3). LEC. 3.** Pr., sophomore standing.
- 424-425-426. **VISUAL DESIGN I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 222, 223, junior standing. The application of communicative procedures and skills necessary to convey messages by means of graphic presentation; an in depth study of problem solving. Development of student's individual style and main potential.
- 434-435-436. **ADVANCED PAINTING/ DRAWING I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 231, 232, 233, junior standing. Open to VAT majors only. Advanced painting with optional media and subject idea. Development of student's individual style and main potential.
- 444-445-446. **ADVANCED PRINTMAKING I-II-III (5-5-5). STUDIO 15.** Pr., AT 213, 244, 245, 246, junior standing. Open to VAT majors only. Advanced printmaking with optional media and subject idea. Development of student's individual style and main potential.

Aviation Management (AM)

Professor Pitts, *Head*

Associate Professors Decker, Fradenburg, and Kiteley

Assistant Professor Callan

Flight Instructor Carter

200. **AEROSPACE PROBLEMS ANALYSIS (5).** Pr., MH 161. Application of basic mathematical and physical concepts to problems in the aerospace industry.
201. **ELEMENTARY AERONAUTICS (5).** LEC. 5. Basic flight physiology, subsonic and supersonic aerodynamics, aircraft propulsion and structures, and aviation maintenance management.
202. **AEROSPACE HISTORY (3).** Significant events and accomplishments in man's attempts to move through the air and space. Emphasis is placed on technological developments.
214. **FLIGHT ORIENTATION (1).** LAB. 3. Basic flight experience course for non-pilots to familiarize aviation majors, engineers, teachers and other students desiring a limited exposure to flight. Course includes ground discussion, experience in flight simulator, and aircraft flight time. Special Fee. Course may be repeated up to three times.
- 215-216. **PRINCIPLES OF PRIVATE FLIGHT I, II (3-3).** General introduction and preparation for the FAA private pilot written examination. Topics: theory of flight, aircraft and engine performance, regulations, meteorology, and navigation.
- 217-218. **PRIVATE PILOT FLIGHT TRAINING I-II (1-1).** LAB. 3-3. For 217 Pr., AM 215, Coreq. 216 or COI. For 218 Pr., AM 215 and 217, Coreq. 216 or COI. Dual and solo flight instruction and discussion to prepare for FAA Private Pilot Certificate. Special Fee.
304. **ELEMENTARY METEOROLOGY (5).** LEC. 5. Pr., sophomore standing. Basic principles, causes, effects, and phenomena of weather with fundamental techniques of forecasting.
305. **AVIATION METEOROLOGY (5).** LEC. 5. Pr., PS 206. Basic meteorology as it applies to the operation of aircraft, with emphasis on observation of weather elements and the interpretation of flight planning weather information.
306. **WEATHER OBSERVATION (2).** Pr., AM 304 or AM 305. Techniques of weather observations and reporting of basic weather information for aviation. Provides assistance for qualification as a supplementary aviation weather station observer.
309. **RECIPROCATING ENGINES AND PROPULSION PRINCIPLES (3).** Pr., PS 206. Introduction to basic laws of operation and types of power plants. Detailed coverage of reciprocating engines including principles of operations, major components and important features.
310. **JET PROPULSION (3).** Pr., AM 309. Review of basic laws as applied to jet propulsion. Detailed study of jet propulsion including principles, components, and major features. Also includes an introduction to propulsion systems used for spacecraft.
312. **GUIDANCE AND CONTROL FUNDAMENTALS (5).** LEC. 5. Pr., PS 206. Practical air navigation and basic principles of aircraft guidance and control.
313. **AEROSPACE VEHICLE SYSTEMS (5).** Pr., PS 206. Design, use, and function of typical hydraulic, mechanical, and electrical systems used on aircraft, missiles, and space vehicles.
314. **AEROSPACE MANAGEMENT AND OPERATIONAL PROBLEMS (3).** Pr., AE 203 or IE 204. Introduction to simulator and inflight use of analog and digital computers; use of digital computers as a management tool in the aerospace industry; case studies and problem assignments.
321. **COMMERCIAL FLIGHT PROBLEMS (3).** LEC. 2, LAB. 3. Pr., AM 218, or Valid Pilot Cert. or COI. Fall. Review of principles of flight, aircraft and engine theory and operation, FAA regulations, navigation, meteorology and aircraft performance and operation as applied to commercial flying. Emphasis on preparation for the FAA commercial written examination.
322. **COMMERCIAL FLIGHT TRAINING I (1).** LAB. 3. Coreq., AM 321 or COI. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on the development of precision and accuracy in all intermediate and advanced flight maneuvers. Special Fee.
323. **AIRCRAFT OPERATION AND PERFORMANCE (3).** LEC. 2, LAB. 3. Pr., AM 321 or COI. Fall. Principles of aircraft performance and operations, including powerplants, aircraft systems and equipment, and advanced flight maneuvers required for commercial pilots.
324. **COMMERCIAL FLIGHT TRAINING II (1).** LAB. 3. Coreq., AM 323 or COI. Continuation of flight training toward a Commercial Pilot Certificate with emphasis on cross-country, night and instrument flying. Special Fee.
325. **PRINCIPLES OF INSTRUMENT FLIGHT (3).** LEC. 2, LAB. 3. Pr., AM 323 or COI. Winter. Instruments, FAA regulations, air traffic control procedures, radio navigation, meteorology, and aircraft operation and performance as applied to instrument flying preparation for the FAA Instrument Pilot Written Examination.
326. **COMMERCIAL FLIGHT TRAINING III (1).** LAB. 3. Pr., AM 321 and 323. Coreq., 325 or COI. Continuation of flight training for the Commercial Pilot Certificate with training in transition to complex aircraft. A continuation of instrument and night instruction and a review of all maneuvers for the commercial flight test. Special Fee.
327. **COMMERCIAL FLIGHT TRAINING IV (1).** LAB. 3. Pr., AM 326. Coreq., 325 or COI. Completion of FAA requirements for an unrestricted Commercial Pilot Certificate. Special Fee.

401. **AERONAUTICAL SEMINAR (1).** Pr., senior standing. Special problems and current status of the aerospace industry.
403. **GENERAL AVIATION MANAGEMENT (3).** Pr., junior standing. An overview of general aviation and its impact and interaction with the total aviation industry including a study of the various users, the suppliers and service organizations, the aircraft and facilities and regulatory framework.
404. **GENERAL AVIATION OPERATIONS (3).** LEC. 2, LAB. 3. Pr., AM 403. Spring. Current principles and practices in commercial aviation operations including organization, sources of revenue, functions, operation and typical problems. Laboratory assignments are provided through the School of Aviation.
407. **AIR TRANSPORTATION (5).** Pr., AM 202, MT 372. Significance of air transportation and the development of the present system. Economics, and social costs of U.S. air transportation system.
409. **AEROSPACE LEGISLATION (3).** Pr., AM 407. Development and present status of federal, local and state, and international regulation of aviation using case study methods.
413. **AIRPORT MANAGEMENT (3).** Pr., junior standing. Current practices in management of a civil public airport, including organization, functions, operations, sources of revenue, funding, maintenance and administration.
414. **AIRPORT PLANNING (3).** Pr., AM 413. Spring. Principles and procedures pertaining to planning airport facilities required to meet the immediate and future air transportation of a community or region.
417. **AIRLINE OPERATIONS (5).** Pr., AM 409 or COI. Airline organizational and managerial practices; the functions and problems of various organizational components.
418. **INTERNATIONAL AIRLINES OPERATIONS (3).** Pr., AM 409, junior standing. Spring. International foreign air carriers, influences of ICAO and IATA, national ownership, determinants of power, operational and management practices, routes and fares.
419. **AIR TRAFFIC CONTROL (5).** LEC. 5. Pr., AM 312. Basic air traffic control procedures, facilities, centers, and operations.
420. **AIR CARGO OPERATIONS (3).** Pr., junior standing. Spring. Domestic and international air cargo operations with emphasis on cargo economics, equipment, domestic and international regulatory activities, agents, operational techniques, systems, and problems.
426. **FUNDAMENTALS OF MULTIENGINE FLIGHT (2).** Pr., AM 327. A discussion of the certification procedures for multiengine aircraft. Emphasis to be placed on aerodynamics and flight performance of multiengine aircraft.
427. **MULTI-ENGINE TRAINING I (1).** LAB. 3. Pr., a valid commercial pilot certificate or COI. Instruction in the methods and techniques of multi-engine aircraft pilotage. Sufficient ground and flight instruction is given to qualify for the FAA pilot rating of Multi-Engine-Land. Special Fee.
428. **PRINCIPLES OF FLIGHT INSTRUCTION (3).** Pr., AM 327. Winter. The principles of teaching as applied to instructing, analyzing, and evaluating flight students with emphasis on preparation for the FAA Flight Instructor's Written Examination.
429. **FLIGHT INSTRUCTOR TRAINING (1).** LAB. 3. Coreq., AM 428 or COI. Discussion, instruction, and arranged practice in flight instruction in preparation for the FAA Flight Instructor Certificate. Special Fee.
431. **MULTI-ENGINE FLIGHT TRAINING II (1).** LAB. 3. Pr., AM 327 or 422, 427. Instrument and night operations to develop flight proficiency in multi-engine aircraft in actual air transportation operation. Includes ten hours experience as co-pilot. May be repeated once. Special fee.
432. **PRINCIPLES OF PROFESSIONAL FLIGHT (3).** LEC. 3. Pr., AM 305, 325 or 421. Winter. The principles and practices for flight crew qualifications in the areas of aircraft performance, IFR operations, high altitude meteorology, and FAR Parts 121 and 135.
433. **TRANSPORT AIRCRAFT FLIGHT TRAINING (2).** LEC. 1, LAB. 3. Pr., AM 327 or 422, 427. Includes dual instruction in instrument techniques, emergency operation, and performance of multi-engine aircraft. Suitable for preparation for the flightcheck for an Airline Transport Pilot certificate if otherwise qualified. Special Fee.
434. **PRINCIPLES OF INSTRUMENT FLIGHT INSTRUCTION (2).** Pr., AM 428. Emphasis placed on instructional techniques involving basic instrument flying, enroute and approach, and departure procedures in preparation for the FAA written examination.
435. **INSTRUMENT FLIGHT INSTRUCTOR TRAINING (1).** LAB 3. Coreq. AM 434 or COI. Discussion, instruction, and arranged practice in instrument flight instruction in preparation for the FAA Instrument Instructor Certificate. Special fee.
491. **SPECIAL PROBLEMS (VARIABLE CREDIT 1-5).** Pr., department approval. Individual student endeavor under faculty supervision involving special problems of an advanced nature in aviation management. May be taken more than once with a maximum credit of 10 hours.

ADVANCED UNDERGRADUATE AND GRADUATE

551. **AEROSPACE SCIENCE (5).** A non-technical presentation of the principles and fundamentals of aviation and aerospace science, related systems, and related equipment. The course is primarily designed for students who require a general knowledge of aviation or aerospace science. It will include lectures by aerospace authorities and visits to aeronautical and aviation facilities. Not open to engineering students.

Biology (BI)

Coordinator and Professor Mason

For other staff and biology courses, see sections for Botany and Microbiology and Zoology-Entomology.

101. **PRINCIPLES OF BIOLOGY (5). LEC. 4, LAB. 2.** All quarters. Integrated principles of biology, emphasizing structure and function of cells, reproduction, heredity, ecology, and evolution.
102. **PLANT BIOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 101. All quarters. The morphology, physiology, relationships, distribution, and importance of plants.—Credit will not be allowed for both BI 102 and 104 or 102 and 110.
103. **ANIMAL BIOLOGY (5). LEC. 4, LAB. 3.** Pr., BI 101. All quarters. The morphology, physiology, relationships, distribution, and importance of animals.—Credit will not be allowed for both BI 103 and 104 or 102, 103 and 110.
104. **BIOLOGY IN HUMAN AFFAIRS (5). LEC. 5.** Pr., BI 101. All quarters. Application of biological principles to an understanding of man as an organism and as a member of an ecosystem. Credit will not be allowed for BI 104 and 103 or for BI 104 and 102.
110. **PLANTS AND ANIMALS IN RELATION TO MAN (3). LEC. 3.** Winter, Spring. Organisms important to man biologically, economically, and culturally. Emphasis on information of interest and importance to the average non-scientist. Credit not allowed for both BI 110 and 102 or BI 110 and 103.

Botany and Microbiology (BY)

Professors Lyle, Head, Curl, D. Davis, N. Davis, Diener,

Gudauskas, Marshall, Mason, Patterson, Rodriguez-Kabana, and Truelove

Associate Professors Backman, Blevins, Cody, Freeman, Morgan-Jones, Peterson,
Weete, Williams, and Wilt

Assistant Professors Campbell, T. Davis, Goslin, V. Kelley, W. Kelley, and Shands

Instructor Varner

Adjunct Instructor Corsby

With few exceptions Principles of Biology, BI 101 and Plant Biology, BI 102, are prerequisite to all courses in this department. For a description of these and other general biology courses see the section for Biology (above).

105. **MICROBES AND MODERN MAN (5). LEC. 5.** Fall, Winter, Spring. Survey of microbiology for students interested in facets of microbiology directly affecting human affairs; no previous college chemistry or biology is assumed. Basic biology of bacteria, fungi, and viruses and their relation to other living systems; special attention given to recognition and control of infectious agents, effective use of vaccines, safe food handling procedures, and other aspects important to human health. This course will not satisfy a curriculum requirement for BY 300.
215. **INTRODUCTORY BIOLOGICAL STATISTICS (5). LEC. 4, LAB. 2.** Pr., MH 160. Fall, Winter. Elementary statistics as applied to agriculture and biology including an introduction to empirical frequency distributions, descriptive statistics, elementary probability, sampling, estimation, testing hypotheses, linear regression, correlation, and the analysis of variance.
216. **INTRODUCTORY BIOLOGICAL COMPUTATIONS (3). Lec. 3.** Pr., sophomore level. Winter, Spring. Introductory use of the computer for agricultural and biological computations and data reduction. Introduction to FORTRAN programming and to effective and valid use of available program packages in biology.
300. **GENERAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101, CH 207. All quarters. Fundamentals of microbiology including history of microbiology, cell structure, chemical composition, growth, nutrition, metabolism, genetics, classification, cultivation, and distribution of bacteria, viruses, rickettsia, and fungi, discussion of the effects of chemical and physical agents on the growth of microorganisms. Credit in this course precludes credit for BY 302.
302. **MEDICAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101-102, CH 208. Fall, Spring. Etiology, epidemiology, immunity, identification and pathogenesis of microorganisms of medical importance to man. Credit in this course precludes credit for BY 300. A similar statement is shown for BY 300 above.
306. **FUNDAMENTALS OF PLANT PHYSIOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 102, CH 203 or 207 or equivalent. Fall, Winter, Spring. General aspects of fundamental life processes of plants involving physiological, structural, and environmental relationships.
309. **GENERAL PLANT PATHOLOGY (5). LEC. 4, LAB. 2.** Pr., BI 101-102. Winter, Spring. Nature cause, and control of plant diseases illustrated by studies of the more common diseases of cultivated crops.
310. **FOREST PATHOLOGY (3). LEC. 1, LAB. 4.** Pr., BI 101-102 or equivalent. Spring. Diseases of forest and ornamental trees from seedling to maturity including cause, identification, prevention, and control; decay in timber and forest products. Field trips emphasize major tree diseases in Alabama.

320. **WEED IDENTIFICATION AND ECOLOGY (3). LEC. 2, LAB. 3.** Pr., BI 101-102 or equivalent. Fall. Identification of weeds in vegetative state and weed seeds. Weed distribution environment requirements, and competitive ability in crops. Field trips will be taken and weed seed collections will be required.
321. **MODE OF ACTION AND FATE OF HERBICIDES (3). LEC. 2, LAB. 3.** Pr., BI 101-102 or AY 321, CH 207 or equivalent. Spring. Herbicide absorption, translocation by plants and effects on plant processes. Behavior of herbicides in soils and effects on soil microorganisms. Mechanisms of herbicide inactivation and the basis for herbicide selectivity.
403. **PESTICIDES (5). LEC. 4, LAB. 3.** Pr., CH 207. Winter. The chemistry, mode of action, activity, formulations, applications, and legal aspects of pesticide application.
407. **CONCEPTS OF PEST MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., COI. Fall. Pest management technology and philosophy.
408. **MARINE BOTANY (6). LEC. 8, LAB. 24, 4 days/5 weeks.** Pr., BI 101-102 or equivalent. General survey of marine algae, vascular and non-vascular plants associated with the marine and estuarine environment. Structure, reproduction, identification, distribution, and ecology are considered. Offered only at Dauphin Island Sea Laboratory.
409. **MARSH ECOLOGY (6) LEC. 8, LAB. 24, 4 days/5 weeks.** Pr., advanced standing in biology. Floral and faunal elements various marine marsh communities. Interaction of physical and biological factors will be emphasized. Structured to provide actual field experience. Trips scheduled to acquaint students with examples of marsh types. Offered only at Dauphin Island Sea Laboratory.
446. **CLINICAL MICROBIOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 300, junior standing. Fall, Spring. Isolation, cultivation, identification, classification and pathogenesis of infectious agents, including from clinical materials: Mycoplasmata (PPLO), Rickettsiae, and Spirochaetes.
460. **SPECIAL PROBLEMS (1-3).** Pr., COI, senior standing. All Quarters. A. Anatomy; B. Ecology; C. Morphology; D. Pathology; E. Physiology; F. Taxonomy; G. Applied Microbiology; H. Diagnostic Microbiology; I. Microbial Ecology; J. Microbial Physiology; K. Microbial Taxonomy; L. Virology; A student cannot register for more than 3 hours credit in any one quarter or any one area.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **BIOLOGICAL STATISTICS (5). LEC. 4, LAB. 2.** Pr., MH 161. Fall, Winter, Spring. Basic concepts of experimental statistics, distributions, confidence limits, tests of significance, analysis of variance, linear correlation and regression. For advanced undergraduates and as a beginning course for graduate students in biological sciences.
503. **MICROBIAL TAXONOMY (5). LEC. 3, LAB. 4.** Pr., BY 300. Winter, Summer. International Code of Nomenclature of bacteria and viruses. The development of microbiological literacy, classification of taxa based on phylogeny, molecular and numerical concepts.
504. **INTRODUCTION TO INDUSTRIAL MICROBIOLOGY (3). LEC. 3.** Pr., By 300. Winter. Principles and practices of microbiologists in industry areas surveyed to include manufacture of fermented foods, alcoholic beverages, antibiotics, amino acids, enzymes, and single-cell protein.
505. **INTRODUCTORY MYCOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Fall. A systematic survey of the fungi with emphasis on morphology.
506. **SYSTEMATIC BOTANY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Spring, Summer, Fall. Identification, classification, nomenclature, distribution and systematic relationship of the seed-bearing plants, utilizing primarily elements of the local flora as study material. The historical background, literature of plant taxonomy, and rules of nomenclature. Field trips will include an overnight week-end field trip.
507. **SALT MARSH ECOLOGY (6). LEC. 4, LAB. 12.** Pr., Ten hours of biology including introductory botany. Summer. The botanical aspects of local marshes; includes plant identification, composition, structure, distribution and development of coastal marshes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Miss.
508. **MARINE MICROBIOLOGY (7½). LEC. 5, LAB. 12.** Pr., General Microbiology and advanced microbiology or COI. Summer. Introduces the student to the role of microorganisms in the oceans and estuaries. Special emphasis on bacteria and fungi. Lecture and laboratory work includes sampling procedures, taxonomy of marine bacteria, mineralization, microbial fouling, pollution, and diseases of marine animals. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
509. **MARINE BOTANY (6). LEC. 5, LAB. 12.** Pr., Ten hours of biology, including introductory botany, or COI. Summer. Survey, based upon local examples, of the principal groups of marine algae and maritime flowering plants, involving their structure, reproduction, distribution, identification, and ecology. Restricted to participants in the Gulf Coast Research Laboratory Teaching Session.
510. **AQUATIC FUNGI (5) LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Summer. Taxonomy, morphology, and ecology of fungi associated with plant and animal substrata in water. The contribution by fungi to the energy budget of aquatic communities will be made. Field trips will be made.
511. **PHYCOLOGY (5). LEC. 2, LAB. 6.** Pr., BI 101-102 or equivalent. Spring. The identification, growth, reproduction, distribution, evolution and economic importance of the algae. Field trips will be made, including an overnight week-end trip.
513. **GENERAL PLANT ECOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 306. Fall and Spring. Natural vegetation, environment, and interrelationships between the two with primary emphasis on the Southeastern United States. Field trips will be made, including an overnight week-end trip.

514. **BIOLOGICAL MICROTÉCHNIQUE, MICROSCOPY, AND PHOTOGRAPHY (5). LEC. 2, LAB. 6.** Pr., BI 102-103 or equivalent and COI. Fall. Methods of tissue preparation for observation with the light microscope, including fixing, paraffin and plastic embedding, sectioning, general and cyto-chemical staining, and mounting. Squash techniques. Optical microscopy, micrometry, and photomicrography. Techniques for developing, printing, enlarging, and copying for photographic illustration. Preparation of 2 x 2 transparencies.
515. **DEVELOPMENTAL PLANT ANATOMY (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Winter. Comparative anatomy of vascular plants with emphasis on structural and developmental relationships. A review of current anatomical, experimental, and ultra-structural research in plant anatomy.
516. **MORPHOLOGY OF LAND PLANTS (5). LEC. 3, LAB. 4.** Pr., BI 101-102 or equivalent. Spring. Comparative morphology of the principal groups of land plants with emphasis on structure, development, reproduction, and evolutionary relationships. Living and fossil members of the local flora will be used as study material. Field trips will be made.
530. **PLANT NEMATOTOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 309, BI 101 or COI. Winter, even years. Various roles of nematodes in relation to plant diseases caused by the nematodes and other pathogens. Identification of the plant nematodes nature of pathogenicity; principles and practices of control; recent advances in phytonematology.
535. **HISTORY OF SELECTED TOPICS IN BOTANY AND MICROBIOLOGY (3). LEC. 3.** Summer. The events, times, and personalities that lead to our current understanding of selected aspects in Botany and Microbiology and allied disciplines.
540. **MICROBIAL PHYSIOLOGY (3). LEC. 3.** Pr., BY 300, CH 203 or 207. Fall. Cellular structure, function, nutritional requirements, energy metabolism, growth cycles, active transport mechanisms, biosynthesis, and mutation and genetics.
- 540L. **MICROBIAL PHYSIOLOGY LABORATORY (3). LAB. 6.** Pr., BY 540. Winter. Laboratory experiments conducted on instrumentation, staining mechanisms, protoplast formation, cellular function, Warburg respirometry, Nephelometry, bioassay, U.V. light irradiation and photoreactivation, mutation, antibiotic sensitivity, and ultrasonic rupture of organisms.
541. **SANITARY MICROBIOLOGY (5). LEC. 3, LAB. 4.** Winter; Spring. Pr., BY 300. Theory and application of fundamental principles of microbiology, ecology and biochemistry of microorganisms in water and sewage.
542. **GENERAL VIROLOGY (5). LEC. 3, LAB. 4.** Pr., BY 300, or equivalent. Spring, Fall. The molecular biology of bacterial, plant, and animal viruses; pathogenesis, diagnosis, and cultivation.
543. **IMMUNOLOGY (5). LEC. 3, LAB. 4.** Pr., BY 446, COI. Spring, Winter. Immunobiology and immunochemistry of humoral and cellular mechanisms of immunity.
544. **MICROBIOLOGICAL METHODS (5). LEC. 3, LAB. 4.** Pr., BY 300. Spring, Fall. Theory and practice of analytical microbiology.
550. **METHODS IN PLANT PATHOLOGY (3). LAB. 5.** Pr., BY 300, 309 or equivalent. Winter. Methods for field assessment of disease damage and sampling disease diagnosis. Preparation of culture media. Procedures for isolation and identification of causal agent, and proof of pathogenicity.
551. **FOLIAGE HARVEST AND STORAGE DISEASES (3). LEC. 2, LAB. 2.** Pr., 309 or equivalent. Fall. Survey of major diseases of aerial plant parts and fruits. Principles of epidemiology. Harvest diseases and storage problems.
552. **SOIL-AND SEED-BORNE DISEASES OF PLANTS (4). LEC. 2, LAB. 4.** Pr., BY 309 or equivalent. Spring. Important diseases of seeds, roots, and other subterranean plant parts: including vascular disorders.
553. **PRINCIPLES OF PLANT DISEASE CONTROL (3). LEC. 2, LAB. 2.** Pr., BY 309. Spring. Control of important plant diseases utilizing the principles of protection and resistance emphasizing chemical control by protectant and systemic fungicides, antibiotics, fumigants, eradication, exclusion, non-target effects, and integrated control systems.
554. **PRACTICAL PLANT PATHOLOGY I (5). LEC. 3, LAB. 4.** Pr., BY 501, 551, 552, or equivalent. Summer. A field and laboratory course in plant disease identification, estimation of losses, and control recommendations.
555. **PRACTICAL PLANT PATHOLOGY II (5). LEC. 3, LAB. 4.** Pr., BY 554. Summer. Field plot design, evaluation of disease development and data processing in plant pathology.

GRADUATES ONLY, MAJOR OR MINOR

601. **BIOLOGICAL STATISTICS II (5). LEC. 4, LAB. 2.** Pr., BY 501 or equivalent. Winter. Analysis of variance, randomized block, Latin square and split plot designs, factorials, analysis of covariance, and multiple regression.
602. **LEAST SQUARES ANALYSIS OF EXPERIMENTS (5). LEC. 4, LAB. 2.** Pr., BY 501 and 601 or equivalent. Spring, even years. Analysis and interpretation of experimental data by least squares procedures; general linear models and hypotheses; weighted regression; irregular two-factor design.
603. **PLANT MORPHOGENESIS (5). LEC. 3, LAB. 4.** Pr., BY 306 and either BY 515 or 516. Winter. Factors responsible for control and development of form in nonvascular and vascular plants. Laboratory procedures will be largely experimental including techniques for the sterile culture of plant spores, embryos, and excised tissues and organs.
604. **ADVANCED PLANT PHYSIOLOGY I (5). LEC. 3, LAB. 4.** Pr., BY 306 and 10 hours of organic chemistry. Winter. Molecular biology and plant metabolism; a correlation of the fine structures of the cell with metabolic pathways occurring therein.

605. **ADVANCED PLANT PHYSIOLOGY II (5). LEC. 3, LAB. 4.** Pr., BY 604 and COI. Fall. Water relations and mineral nutrition: Internal and external factors affecting the absorption, translocation, utilization, and loss of water and mineral elements by green plants.
606. **ADVANCED PLANT PHYSIOLOGY III (5). LEC. 3, LAB. 4.** Pr., BY 604 and COI. Spring. Plant growth. A review of literature and laboratory methodology of plant physiological subject matter in the areas of plant growth regulators, mode of action of growth regulators, and factors affecting plant growth.
608. **ADVANCED SYSTEMATIC BOTANY (5). LEC. 2, LAB. 6.** Pr., BY 506. Fall. Experimental and research aspects of the taxonomy of vascular plants. The literature, techniques and methodology relative to the identification and biosystematic classification of evolutionary units; intensive study of special groups of plants and the application of resultant data to specific taxonomic problems.
610. **ADVANCED MICROBIAL PHYSIOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 540, CH 518. Spring, odd years. Physiology of microorganisms; energy transfer mechanisms, metabolism, sexuality and mutation.
613. **SYSTEMATIC BACTERIOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 503. Summer. Isolation, purification, and identification of bacteria; experimental application of international rules of nomenclature.
614. **ENVIRONMENTAL EFFECTS OF FOOD AND ENERGY PRODUCTION (5). LEC. 3, LAB. 4.** Pr., BY 513. Summer, odd years. Environmental impacts of food production and various energy-producing systems. A 5-day field trip will be made for assessment of these activities.
616. **CYTOLOGY AND CYTOGENETICS (5). LEC. 3, LAB. 4.** Pr., ZY 300. Winter. Cell structure and function, with emphasis on cell reproduction and factors contributing to the evolution of organisms.
617. **PHYTOVIROLOGY (5). LEC. 3, LAB. 4.** Pr., BY 309 or 310, 542. Winter, odd years. To acquaint students with viruses as plant pathogens and the diagnosis and control of diseases caused by them. Laboratory will involve methodology in the transmission, isolation, and characterization of viruses which infect plants.
618. **CLINICAL PLANT PATHOLOGY (5). LEC. AND LAB. 8.** Pr., BY 309 or equivalent or COI. Summer, even years. Identification, epidemiology, etiology, and control of the major diseases on various kinds of economic plants, to be selected on the basis of current needs of the students.
619. **ADVANCED PLANT PATHOLOGY II (5). LEC. 3, LAB. 4.** Pr., BY 309 or equivalent. Summer, odd years. Biological significance of etiology, epiphytology, and host-parasite relations in plant diseases. Classical and current theory will be considered in relation to concepts and problems in plant pathology.
620. **CHEMICAL WEED CONTROL (5). LEC. 3, LAB. 4.** Pr., BY 306, 506, or AY 514. Summer, odd years. Application, mode of action, physiological relationships, recent advances, and special weed problems.
621. **INDUSTRIAL MICROBIAL TECHNOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 504, CH 519. Spring, even years. Primarily a laboratory course dealing with research and development methods applicable to industrial microbiology. Topics include: secondary-screening techniques, qualitative and quantitative methods for production, detection, purification of microbial products, design and operation of a pilot plant fermentor for production of single-cell protein, and one or more individual projects on fermentations on industrial processes of special interest to the student.
623. **ADVANCED MEDICAL MICROBIOLOGY (5). LEC. 2, LAB. 6.** Pr., BY 300 and 542 or equivalent. Winter. Experimental and theoretical aspects of mechanisms of pathogenicity/virulence infectivity; pathologic manifestations, and biochemical activities of microorganisms of medical importance.
625. **SPECIAL PROBLEMS. CREDIT TO BE ARRANGED.** A. Cytology; B. Ecology; C. Morphology; D. Mycology; E. Nematology; F. Pathology; G. Physiology; H. Taxonomy; I. Chemical Weed Control; J. Marine Botany; K. General Biology Teaching & Permission of Instructor; L. Virology; M. Microbial Ecology; N. Experimental Microbiology; O. Clinical Microbiology; P. Medical Virology; Q. Serology; R. Microbial Physiology; S. Microbial Taxonomy; T. Biological Statistics; and U. Statistical Genetics; V. Mycotoxicology. W. Plant Anatomy.
626. **ADVANCED MYCOLOGY I (5). LEC. 2, LAB. 6.** Pr., BY 505 and COI. Spring, even years. Classification of fungi and lichens. Detailed studies of selected families of Ascomycetes and Fungi imperfecti. Interpretation of comparative morphological criteria and ontogenic patterns as a guide to phylogeny. Intensive floristic investigations of particular habitats.
627. **ADVANCED MYCOLOGY II (5). LEC. 2, LAB. 6.** Pr., 505 and COI. Spring, odd years. Classification of fungi. A detailed survey of the Myxomycetes, Phycomycetes, and Basidiomycetes. Special emphasis will be placed on ecological aspects of fungi in freshwater and forest habitats. Fungal genetics will be studied.
640. **DEPARTMENT FORUM (1).** Required of all majors, open to all minors. May be taken more than one quarter. Fall, Winter, Spring. Discussions concerning current topics in the various sciences and related fields.
650. **NUCLEAR SCIENCE IN AGRICULTURE (5). LEC. 3, LAB. 4.** Pr., graduate standing with research experience. Summer, even years. Role of nuclear science in agricultural research with training in the use of radioisotopes and familiarization with the possibilities, limitations, and necessary safety precautions.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
799. **DOCTORAL RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Building Science (BSC)

Professor Brandt, *Head*

Associate Professors Darden, Fretwell, Shuttleworth, and Timberlake

Assistant Professors Lechner, Liska, Marsh, Mol, and Taylor

Instructor Wallace

100. **DRAWING & PROJECTIONS (2).** LAB. 6. Basic architectural drafting techniques.
101. **INTRODUCTION TO BUILDING (4).** LEC. 1, LAB. 9. Pr., BSC 100 or TS 102 or AR 110. Graphic construction communications—working drawings, shop drawings, etc.
202. **MATERIALS OF CONSTRUCTION (5).** Pr., MH 160. A survey of common building materials.
211. **MECHANICS OF STRUCTURES (5).** Pr., MH 161, PS 205. Principles of mechanics as applied to building construction; resolution of external forces; analysis of trusses; shear and bending moments.
- 261-262. **HISTORY OF BUILDING I-II (3-3).** Pr., sophomore standing. The development and use of construction methods and materials showing the effects on building from ancient to contemporary times. Lectures, readings, reports.
304. **CONSTRUCTION SYSTEMS (3).** Construction systems for foundations, floors, roofs, and walls.
311. **STRENGTH OF MATERIALS (5).** Pr., BSC 211. Strength of materials of structural members. Lectures, problems.
314. **REINFORCED CONCRETE (5).** Pr., BSC 311. Reinforced concrete. Lectures, research and problems.
315. **APPLIED STRUCTURES (5).** Pr., BSC 314. Applied design of beams and columns in wood and steel.
321. **CONSTRUCTION ESTIMATING I (5).** LEC. 3, LAB. 6. Pr., junior standing. Detailed estimating of building component quantities.
323. **FOUNDATIONS & SOILS (3).** Pr., BSC 314. Soil conditions and their effects on building foundations.
324. **CONSTRUCTION SURVEYING (3).** LEC. 1, LAB. 6. Pr., junior standing. Dimensional controls for buildings.
325. **FORMWORK DESIGN (3).** Pr., BSC 314. Design of concrete formwork.
340. **CONSTRUCTION SAFETY (3).** Coreq., BSC 321. Construction safety. Lectures, readings, and reports.
- 405-406. **CONTRACTING BUSINESS I-II (3-3).** Pr., BSC 304 and senior standing. Organizing, managing, and operating the contracting firm.
- 414-415-416. **ADVANCED STRUCTURES I-II-III (5-5-5).** Pr., BSC 314. Theory and practical design of complex structures, both in steel and reinforced concrete. Lectures, research and problems.
431. **CONSTRUCTION ESTIMATING II (3).** LEC. 3, Pr., BSC 321 and senior standing. Estimating direct and indirect construction costs.
434. **CONSTRUCTION SCHEDULING (5).** Pr., BSC 321 and senior standing. Management techniques for planning, scheduling, controlling costs, and leveling manpower by use of CPM.
- 452-453. **BUILDING AND EQUIPMENT I-II (3-3).** Pr., PS 206. Analysis of heating, air conditioning, water supply, plumbing and electrical systems as related to buildings. Lectures, readings, problems.
460. **SPECIAL PROBLEMS (CREDIT 1-5).** Pr., department head approval, junior standing. Development of an area of concentration through independent study under staff supervision.
490. **TERMINAL PROJECT (8).** LEC. 2, LAB. 15. Pr., final quarter prior to graduation. Cost Analysis and Construction Program for a building or special study (each as approved by the Faculty Committee). Construction program to include all documents required by the Contract and/or necessary to construct the project. Candidate will defend project orally before staff and guest specialists.

Chemical Engineering (CHE)

Professor Chambers, *Head*, Hsu

Associate Professors Guin, Hirth, Lee, Liu, Tarrer, and Vives

Assistant Professors Placek, Ray, and Shah

101. **CHEMICAL ENGINEERING FUNDAMENTALS (1).** A workshop and orientation in chemical engineering practice.
213. **DIGITAL COMPUTERS (2).** LEC. 1, LAB. 3. Workshop on digital computer programming in the area of chemical engineering.
310. **PROCESS ECONOMICS (3).** Pr., junior standing. The economic factors affecting the design, operations, and economic aspects of industrial chemical processing, including cost estimation and feasibility studies.

313. **CHEMICAL ENGINEERING ANALYSIS (4).** Pr., MH 265. Departmental approval. Application of mathematical principles and techniques to the analysis and solution of typical chemical engineering problems.
320. **ANALOG COMPUTATION (3).** Pr., MH 265, PS 222. Departmental approval. The basic principles of analog computer theory and programming applications to chemical engineering. Includes time and amplitude scaling.
321. **CHEMICAL PROCESS PRINCIPLES (4).** Pr., CH 113, PS 220, Coreq., CHE 331. Application of mass balance and stoichiometry to chemical processes and plants.
331. **ENGINEERING THERMODYNAMICS (3).** Pr., MH 264, PS 220. Application of thermodynamic laws and principles to engineering.
332. **CHEMICAL ENGINEERING THERMODYNAMICS I (4).** Pr., CHE 331. Departmental approval. Combined material and energy balances. Applications of second law. Flow processes, energy cycles.
343. **STAGewise PROCESSES (4).** Coreq., CHE 353. Departmental approval. Theory and design methods of stagewise processes such as extraction, leaching and distillation.
352. **FLUID MECHANICS (4).** Pr., CHE 331 or ME 301. Includes conservation equations, momentum transfer in laminar flow, turbulence, dimensional analysis, design calculations for conduits, packed beds, fluidized systems and filtration.
353. **THERMAL TRANSFER (4).** Pr., CHE 352. Departmental approval. Includes heat conduction, heat transfer in laminar flow, turbulent heat transfer, analogy between heat and momentum transfer, boiling and condensing vapor, design calculations on heat transfer equipment and evaporation.
450. **SPECIAL TOPICS IN CHEMICAL ENGINEERING (CREDIT TO BE ARRANGED WITH A MAXIMUM OF 10 HOURS).** Directed reading covering items of chemical engineering theory in depth coupled with individual laboratory work. May be taken more than once.
470. **SEMINAR (1).** SENIOR STANDING. May be taken for credit twice.

ADVANCED UNDERGRADUATE AND GRADUATE

511. **PROCESS DYNAMICS AND CONTROL (5).** LEC. 3, LAB. 6. Pr., CHE 313, senior standing. Departmental approval. Dynamic analysis of chemical processes. Principles of closed loop feedback control theory, stability, root locus, and frequency response. Use of analog computer for process simulation and mathematical modeling.
521. **CHEMICAL ENGINEERING THERMODYNAMICS II (4).** Pr., CHE 332. Departmental approval. Thermodynamics of phase and chemical equilibrium. Introduction to the statistical thermodynamics of perfect gases.
522. **CHEMICAL REACTION ENGINEERING (4).** Pr., CHE 521. Departmental approval. Rates of reactions of various orders and complex reactions in respect to the design of chemical reactors. Considered also are catalytic reaction mechanisms and transfer of mass and heat affecting reactor design and operations.
540. **NUCLEAR ENGINEERING (5).** Pr., PS 305 or 320, MH 265 or COI. Atomic physics and nuclear reactions. Nuclear reactor principles, design, and engineering, including radiation, shielding, instrumentation, and heat transfer.
542. **CHEMICAL ENGINEERING DESIGN I (4).** Coreq., CHE 522. Departmental approval. Individual or group design projects relating to chemical engineering practice.
543. **CHEMICAL ENGINEERING DESIGN II (6).** Pr., CHE 542, senior standing. Departmental approval.
551. **MASS TRANSFER (4).** Pr., CHE 353. Laminar and turbulent mass transfer, gas absorption, humidification and distillation.
560. **INTRODUCTION TO PLASTICS (3).** Pr., CH 304 or COI. High polymers. Includes the chemistry, technology and uses of cellulose, phenolics and amino plastics, polyolefins, vinyls, styrene, acrylics, polyesters, epoxies, polyamides, polyurethanes, silicones and rubbers.
565. **INDUSTRIAL WASTE WATER TREATMENT (4).** LEC. 3, LAB. 3. Pr., CHE 352, ME 340, or CE 308. Introduction to chemical treatment methods for industrial waste water pollutants. Identification and analysis of major industrial water pollutants. Design and cost considerations in chemical process treatment equipment.
575. **RATE PROCESSES IN MATERIALS (3).** Pr., CH 408 or COI. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials.
582. **CHEMICAL ENGINEERING LABORATORY (6).** LEC. 3, LAB. 9. Coreq., CHE 551. Departmental approval. Laboratory work in chemical engineering processes.
585. **AIR QUALITY ENGINEERING (4).** LEC. 3, LAB. 3. Pr., CHE 331 or ME 301. Sources and chemical nature of gaseous pollutants. Principles of mass transfer as related to the removal of gas pollutants. Design calculations and engineering of treatment facilities including adsorption and absorption.
595. **BIOCHEMICAL ENGINEERING (3).** Coreq., CHE 522. Departmental approval. Kinetics and reactor design for fermentation processes. Principles of industrial sterilization.

GRADUATE

600. **CHEMICAL ENGINEERING ANALYSIS I (3).** Pr., graduate standing. Mathematical analysis of chemical engineering problems to include the formulation of differential equations, analytical and numerical techniques for problem solution, data correlation and analysis, and computer applications.

601. **CHEMICAL ENGINEERING ANALYSIS II (3).** Pr., CHE 600. A continuation of CHE 600.
610. **TRANSPORT PHENOMENA I (3).** Coreq., CHE 600. Principles of momentum, heat and mass transport, laminar systems, equations of motion.
611. **TRANSPORT PHENOMENA II (3).** Pr., CHE 610. A continuation of CHE 610.
612. **TRANSPORT PHENOMENA III (3).** Pr., CHE 611. A continuation of CHE 611 with special emphasis on turbulence.
613. **TRANSPORT PHENOMENA IV (3).** Pr., CHE 612. A continuation of CHE 612.
620. **CHEMICAL ENGINEERING THERMODYNAMICS I (3).** Pr., graduate standing. Properties of real gases and liquids, chemicals and phase equilibrium.
621. **CHEMICAL ENGINEERING THERMODYNAMICS II (3).** Pr., CHE 620. Phase equilibrium of non-electrolytes.
622. **ENGINEERING STATISTICAL THERMODYNAMICS I (3).** Pr., CHE 620. Fundamentals of statistical mechanics, partition functions, chemical equilibrium.
623. **ENGINEERING STATISTICAL THERMODYNAMICS II (3).** Pr., CHE 622. Applications of molecular theory and models to the properties of real gases and liquids.
625. **REACTION ENGINEERING I (3).** Pr., CHE 610. Analysis and design of chemical reactors.
626. **REACTION ENGINEERING II (3).** Pr., CHE 625. A continuation of CHE 625.
630. **PROCESS DYNAMICS AND CONTROL I (3).** Coreq., CHE 600. Advanced linear control system analysis and an introduction to nonlinear systems.
631. **PROCESS DYNAMICS AND CONTROL II (3).** Pr., CHE 630. An introduction to modern control theory with emphasis on chemical reactors and stagewise processes.
632. **PROCESS MODELING AND SIMULATION (3).** Pr., CHE 600. Mathematical modeling of chemical process systems, process simulation with analog computers and digital simulation languages.
633. **OPTIMIZATION (3).** Pr., CHE 632. Applications of linear and non-linear optimization techniques to chemical process and equipment design, introduction to optimal control.
640. **DISTILLATION (3).** Pr., COI, graduate standing. Design principles for multicomponent, extractive, azeotropic, and other complex distillation processes.
641. **ABSORPTION AND EXTRACTION (3).** Pr., COI, graduate standing. Design principles for gas absorption and extraction processes.
642. **HEAT TRANSFER (3).** Pr., COI, graduate standing. Analysis and design principles for advanced heat transfer processes, special emphasis on two phase heat transfer in reaction systems, packed beds, and other process equipment.
645. **POLYMER ENGINEERING (3).** Pr., COI, graduate standing. Structure of polymers, molecular forces and properties, polymer formation and modification, kinetics of polymerization, polymer technology and applications.
646. **PROCESS ECONOMICS (3).** Pr., COI, graduate standing. Venture analysis, project justification, cost estimation, and project engineering.
647. **CHEMICAL-PHYSICAL TREATMENT OF WASTE WATER (3).** Pr., CHE 522, 551. Principles of chemical oxidation, adsorption, flocculation and coagulation, and ion exchange as applied to the treatment of waste water.
650. **SPECIAL TOPICS IN CHEMICAL ENGINEERING (CREDIT TBA).** Pr., COI, departmental approval. May be taken more than one quarter.
670. **SEMINAR (1).** Pr., graduate standing. May be taken up to three quarters for credit.
690. **DIRECTED READING IN CHEMICAL ENGINEERING (CREDIT TO BE ARRANGED).** Pr., departmental approval. May be taken more than one quarter.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Chemistry (CH)

Professors Colburn, *Head*, Baker, Melius, Quagliano,
Stevens, Vallarino, and Ward
Adjunct Professor McAuliffe

Associate Professors Dinius, Friedman, Greene, Hargis, Hill, Johnson, Neely, Perry,
Peterson, Shevlin, Wheatley, Worley, and Ziegler
Assistant Professors Aull, Breen, Kohl, Krogh, Livant,
Mathias, Mountcastle, and Webb

101. **INTRODUCTORY CHEMISTRY I (2).** LEC. 3. Pr. or Coreq., MH 140, 160, or 161. To acquaint science students with the classifications of matter and the manner in which the chemist identifies matter and records the nature of its changes. Atomic structure, chemical bonding, molecular aggregations and the laws summarizing the properties and nature of the physical states of matter are considered.

102. **INTRODUCTORY CHEMISTRY II (2). LEC. 3.** Pr., CH 101, Coreq., CH 103L. A continuation of the topics described under CH 101.
103. **FUNDAMENTALS OF CHEMISTRY I (4). LEC. 4.** Pr., high school chemistry, Coreq., MH 160 or 161; CH 103L. Encompasses the subject matter of CH 101 and 102 for the superior student with adequate background preparation. Departmental approval is required for admission to this course.
- 103L. **GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Coreq., CH 102 or 103. The basic laboratory techniques, to experimental measurements, and to the interpretation of data.
104. **FUNDAMENTALS OF CHEMISTRY II (4). LEC. 4.** Pr., CH 103 or 102, Coreq., CH 104L. A continuation of CH 102 or CH 103. The methods of preparation and the reactions of individual as well as classes of chemical compounds are used to study and illustrate the mechanism and dynamics of chemical change.
- 104L. **GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Pr., CH 103L, Coreq., CH 104. A continuation of CH 103L.
105. **FUNDAMENTALS OF CHEMISTRY III (4). LEC. 4.** Pr., CH 104, Coreq., CH 105L. Solution chemistry including various ionic equilibria, coordination compounds, acid-base phenomena and redox processes. Quantitative analytical problem-solving will be emphasized.
- 105L. **GENERAL CHEMISTRY LABORATORY (1). LAB. 3.** Coreq., CH 105. A continuation of CH 103L and CH 104L.
111. **GENERAL CHEMISTRY (5). LEC. 4, LAB. 3.** Coreq., MH 160, or 140, or 161. For chemistry majors and others inclosely related areas. Credit in CH 101, 102 or 103 precludes credit for this course.
112. **GENERAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 111 or 103. Continuation of CH 111. Credit in CH 104 precludes credit for this course.
113. **GENERAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 112. Continuation of CH 112. Credit in CH 105 precludes credit for this course.
201. **DESCRIPTIVE CHEMICAL SCIENCE(5). LEC. 5.** Pr., MH 140. To foster in the non-science student an appreciation for the chemical nature of the material universe and the contribution of chemistry to his cultural heritage. This course will not serve as a prerequisite for any other chemistry course.
203. **ORGANIC CHEMISTRY (5).** Pr., CH 104. Fundamentals of organic chemistry. Designed for students in Home Economics, and others.
204. **ANALYTICAL CHEMISTRY (3). LEC. 3, EACH QUARTER.** Pr., CH 105 and 105L or 113. Theory and application of gravimetric, volumetric, and colorimetric chemical analysis.
- 204L. **ANALYTICAL CHEMISTRY LABORATORY (2). LAB. 8, EACH QUARTER.** Pr. or Coreq., CH 204. Analytical techniques applied to the analysis of ores and minerals.
205. **ANALYTICAL CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 113 or 204. Fundamental concepts used in analytical chemistry and observed in the laboratory via gravimetric analysis and separation techniques.
207. **ORGANIC CHEMISTRY (4). LEC. 4.** Pr., CH 104. This course together with CH 208 meets the needs of students in Laboratory Technology, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Medicine, Pre-Pharmacy, and in other biological sciences.
- 207L. **ORGANIC CHEMISTRY LABORATORY (1). LAB. 3.** Pr. or Coreq., CH 207.
208. **ORGANIC CHEMISTRY (3). LEC. 3.** Pr., CH 207 and 207L. Continuation of CH 207.
- 208L. **ORGANIC CHEMISTRY LABORATORY (2). LAB. 6.** Pr. or Coreq., CH 208.
209. **ORGANIC CHEMISTRY (5). LEC. 5.** Pr., CH 208. A continuation of CH 208 with emphasis on those organic compounds considered to be the most important to the understanding of biochemistry, i.e., polyfunctional compounds, carbohydrates, liquids, amino acids, proteins, and heterocyclic compounds.
301. **BIOCHEMISTRY (5).** Pr., CH 208. Especially designed for students in Pharmacy. Credit in CH 518 precludes credit for this course.
302. **BIOCHEMISTRY (5).** Pr., CH 301. Continuation of CH 301. Credit in CH 519 precludes credit for this course.
303. **ORGANIC CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 113. Organic chemistry covering nomenclature, group reactions, important theories and concepts relating to aliphatic and aromatic compounds, designed primarily for chemistry majors.
304. **ORGANIC CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 303. Continuation and extension of CH 303.
305. **ORGANIC CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 304. Continuation and extension of CH 303-304, including heterocyclic compounds and many classes of compounds of interest in the field of biochemistry. The laboratory portion of the course will deal primarily with organic qualitative analysis.
316. **PHYSICAL CHEMISTRY (5).** Pr., MH 140 or 160, CH 105 and PS 205. A one-quarter course for pre-medicine students.
490. **SPECIAL PROBLEMS IN CHEMISTRY (5). LAB 15.** Pr., COI, senior standing. Not open to graduate students. An individual problem course. Each student will work under the direction of a staff member on some problem of mutual interest. May be repeated for a maximum of 15 credit hours.

ADVANCED UNDERGRADUATE AND GRADUATE

504. **INTRODUCTION TO MOLECULAR ORBITAL METHODS (5).** Pr., CH 305 and 508 or equivalent. Elementary quantum mechanics, Hückel Molecular orbital theory, SCF molecular orbital procedures, orbital symmetry problems, and applications of the various theoretical procedures to organic chemistry.
507. **PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 104 or 112; MH 264; PS 221 or 206. A discussion of the more important theories and laws of physical chemistry.
508. **PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 507. Continuation of CH 507.
509. **PHYSICAL CHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 508. An extension of principles in CH 507-8 with special reference to modern theories of the structure of matter.
510. **INTERMEDIATE INORGANIC CHEMISTRY I (5). LEC. 5.** Pr., CH 508. Atomic structures, valence bonding, and periodic properties of the elements.
511. **INTERMEDIATE INORGANIC CHEMISTRY II (5). LEC. 3, LAB. 6.** Pr., CH 510. Synthesis and purification of typical inorganic compounds.
512. **CHEMICAL THERMODYNAMICS (5).** Pr., CH 508. Basic laws governing changes in energy in gases, liquids, and solids.
513. **ANALYTICAL CHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 507. Fundamental concepts used in instrumental analytical chemistry and as observed in the laboratory via spectrophotometric, electroanalytical, and chromatographic techniques.
515. **POLYMER TECHNOLOGY I (4). LEC. 3, LAB. 3.** Pr., CH 304 or CHE 560. Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture.
516. **POLYMER TECHNOLOGY II (3). LEC. 3.** Pr., CH 515 or TE 424. Continuation of CH 515. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use.
518. **BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 204, 204L, 208. Classification, structure and chemistry of the major chemical constituents of living matter. (Same course as ADS 518.)
519. **BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 518 or its equivalent. Introduction to metabolism. (Same course as ADS 519.)
520. **CLINICAL BIOCHEMISTRY (5). LEC. 3, LAB. 6.** Pr., CH 302 or CH 519 or its equivalent. Principles of clinical chemical analysis.

GRADUATE

610. **ADVANCED INORGANIC CHEMISTRY (5).** Pr., CH 510 or equivalent. Selected groups of inorganic compounds are considered from a modern physicochemical viewpoint; thus emphasizing their chemical and physical properties, their rates of conversion one into another, their molecular structure, and valence relationships.
611. **PHYSICAL METHODS IN INORGANIC CHEMISTRY (5).** Pr., CH 610 or equivalent. The theory and applications of modern techniques for structural and bonding information in inorganic chemistry. NMR, IR, Raman, NQR, mass spectroscopy, electronic spectra, ESR, and other techniques will be discussed.
612. **ORGANO-METALLIC CHEMISTRY (5).** Pr., CH 610 or equivalent. General organo-metallic chemistry with an emphasis on recent developments.
614. **THE CHEMISTRY OF COORDINATION COMPOUNDS (5).** Pr., CH 510 or equivalent. Complex inorganic compounds with emphasis on early and modern developments, isomerism, chelation, and methods of determining formation constants.
616. **ADVANCED TOPICS IN INORGANIC CHEMISTRY (5).** Pr., CH 610 or equivalent. Includes the most active research areas of modern inorganic chemistry.
620. **ADVANCED ORGANIC CHEMISTRY I (5). LEC. 5.** Pr., CH 305 or equivalent. Organic reaction mechanisms, free radicals, carbonium ions, carbanions, carbenes, etc.
621. **ADVANCED ORGANIC CHEMISTRY II (5). LEC. 5.** Pr., CH 620. Physical organic chemistry with emphasis on the interpretation of organic reaction mechanisms.
622. **ADVANCED ORGANIC CHEMISTRY III (5). LEC. 5.** Pr., CH 620. Current synthetic methods of organic chemistry.
623. **HETEROCYCLIC COMPOUNDS (5).** Pr., CH 621 or equivalent. Organic compounds containing heterocyclic ring systems.
624. **ELEMENT-ORGANIC COMPOUNDS (5).** Pr., CH 621 or equivalent. Organic chemistry of Groups III, IV and V elements.
625. **ORGANIC NITROGEN COMPOUNDS (5).** Pr., CH 621 or equivalent. Organic compounds containing nitrogen.
627. **SPECIAL TOPICS IN ORGANIC CHEMISTRY (5).** Pr., CH 621 or equivalent. A selection of modern topics in organic chemistry.
628. **INTRODUCTION TO THEORETICAL ORGANIC CHEMISTRY (5).** Pr., CH 621 or equivalent. Topics generally considered include molecular structure; chemical reactions and energy change; structure-reactivity relationships; dipole moments and carbonium, olefinic and free-radical stability; and organic chemical spectroscopy.

- 630-631. ADVANCED PHYSICAL CHEMISTRY (5-5).** Pr., CH 509. CH 630 is pr. for CH 631. Topics generally considered include kinetic theory of matter, modern theories of the structure of matter, generalized thermodynamics, relation of molecular structure to spectroscopic and thermodynamic properties, and kinetics of chemical reactions.
- 632. RELATION BETWEEN STRUCTURE AND PROPERTIES OF CHEMICAL SUBSTANCES (5).** Pr., CH 631. Established relationships that exist between structures of organic and inorganic compounds and physical properties which are relatively easy to determine. The principal aim is the demonstration of the fundamental relation of structure compounds and electronic configurations.
- 633. CHEMICAL KINETICS (5).** Pr., CH 631. The mathematics and characterization of chemically reacting systems includes discussions of the collision theory, the transition state theory, unimolecular reactions in condensed phases, behavior of nonstationary-state systems, and photochemistry.
- 634. HETEROGENEOUS EQUILIBRIA (5).** Pr., CH 631. Chemical and physical equilibria in heterogeneous systems.
- 635. STATISTICAL THERMODYNAMICS (5).** Pr., CH 631. Statistical approach to thermodynamics and chemical equilibrium.
- 637. INTRODUCTION TO QUANTUM CHEMISTRY (5).** Pr., CH 631. Quantum theory as applied to chemical problems.
- 638. MOLECULAR SPECTROSCOPY (5).** Pr., CH 631. Theory and application of optical and magnetic resonance spectroscopy.
- 640. CARBOHYDRATES (5).** Pr., CH 518 or equivalent. The chemistry of the mono- and polysaccharides.
- 641. PROTEINS (5).** Pr., CH 507 and CH 519 or equivalent. Chemical and physical properties of amino acids and proteins, protein structure and the relation of protein structure to function.
- 642. LIPIDS (5).** Pr., CH 519 or equivalent. Chemistry of the lipids and their biological significance.
- 643. ENZYMES (5).** Pr., CH 519 or equivalent. The principles of enzyme chemistry including the physical and catalytic properties of enzymes.
- 644. TOPICS IN BIOCHEMISTRY (1-10).** Pr., CH 519 or equivalent and COI. Advanced selected areas of research and the techniques for characterization of macromolecules.
- 645. BIOCHEMICAL RESEARCH TECHNIQUES (5).** Pr., CH 519 or equivalent. Modern biochemical laboratory techniques.
- 646. PHYSICAL BIOCHEMISTRY (5).** Pr., CH 305 and CH 509 or equivalent. The structure and properties of biological compounds (saccharides, lipids, amino acids, proteins, nucleic acids, and enzymes). The bioenergetics of the important metabolic pathways are investigated. Emphasis on structure of biological compounds and mechanisms of biological reactions.
- 650. ANALYTICAL CHEMISTRY (5).** Pr., CH 513 or equivalent. Analytical principles, applications and methods, mathematical interpretations, and current developments.
- 651. ANALYTICAL CHEMISTRY (5).** LEC. 4, LAB. 3. Pr., CH 513. Analytical application of chemical spectroscopy.
- 652. THEORIES AND CURRENT TOPICS OF ANALYTICAL CHEMISTRY (5).** Pr., CH 651. Winter, odd years.
- 653. PHYSIO-CHEMICAL SEPARATIONS (5).** LEC. 4, LAB. 3. Pr., CH 509. Spring, even years.
- 654. RADIOCHEMICAL ANALYSIS (5).** LEC. 3, LAB. 6. Pr., CH 205. Summer, odd years. The application of radioactive tracers and related techniques to chemical analysis.
- 655. CHEMICAL INSTRUMENTATION (5).** LEC. 5. Chemical transducers and conversion of the transducer output to some usable form.
- 670. SEMINAR (1).** Each quarter except Summer. Required course for all graduate students in chemistry. May be repeated for a maximum of 10 credit hours.
- 691. DIRECTED INDIVIDUAL STUDY IN CONTEMPORARY CHEMISTRY. (CREDIT TO BE ARRANGED.)** Pr., completion of 30 hours of graduate courses in chemistry. May be repeated for credit.

Civil Engineering (CE)

Professors Hudson, *Acting Head*, and Judkins

Associate Professors Jenkins, Molz, Moore, Ramey, and Warman

Assistant Professors Bell, Johnson, Kurt, Morgan, Parr, and Vecellio

- 201. SURVEYING (5).** LEC. 4, LAB. 3. Pr., CE 202 or concurrently. Data collection and analysis emphasized. Analysis of errors; simple curves, vertical curves, spirals; topographic mapping and land surveying.
- 202. INTRODUCTION TO COMPUTER METHODS IN CIVIL ENGINEERING (3).** LEC. 2, LAB. 3. Pr., MH 264 or concurrently. Introduction to electronic digital computer programming; machine solution of civil engineering problems; library programs.
- 205. ENGINEERING MECHANICS—STATICS (4).** Pr., PS 220 or concurrently. Coreq., MH 264. Basic principles of statics. Free body concepts. Parallel, concurrent, and nonconcurrent force systems, coplanar and noncoplanar. Friction. Centroids, and moments of inertia.

207. **MECHANICS OF SOLIDS (3).** Pr., CE 205 or ME 205, and MH 264. Coreq., MH 265. Principles of strength of materials; Equilibrium, compatibility, and properties of materials. Mechanics of deformable bodies. Stress-strain-temperature relations. Simple application to stress and deformation analysis of axial force, torsion and flexure problems. Shear and moment at sections.
301. **CIVIL ENGINEERING ANALYSIS (5).** Pr., CE 202. MH 265. Applications of mathematics to analysis of physical systems encountered in civil engineering.
304. **THEORY OF STRUCTURES I (4).** Pr., CE 207 and MH 265. Objectives of structural design, structural form, introduction to structural analysis. Stability and determinacy of structures. Analysis of statically determinate trusses, beams, frames, arches and cables. Shear, moment and thrust diagrams. Influence lines. Moving loads. Deflections by double integration of moment area. Stress analyses. Introduction to column buckling.
- 304L. **STRUCTURES LABORATORY (1). LAB. 3.** Coreq., CE 304. Laboratory assignments in strain measurement, determination of stress-strain relations, stress-distribution analysis, and experimental behavior of structural components.
305. **WATER SUPPLY AND DISPOSAL SYSTEMS (5).** Pr., CE 308. Theory and design of water collection and distribution facilities and waste water collection systems.
308. **HYDRAULICS (5).** Pr., CHE 331 or equivalent. Ideal fluid flow, real fluids, fluid resistance; fluid measurement and control: steady pipe flow, steady open channel flow; unsteady flow. Emphasis on steady flow and open channel flow.
- 308L. **HYDRAULICS LABORATORY (1). LAB. 3.** Pr., CE 308. Assignments in analysis of experimental data, discharge coefficients of orifices, culverts, weirs, and other control sections, hydraulic and energy grade lines, water surface profiles, pump characteristic curves and unsteady flow.
312. **HYDROLOGY (4).** Pr., CE 308. Hydrologic cycle, surface and subsurface runoff, meteorology and precipitation, rational formula, unit hydrograph, flood routing, return period, evaporation.
315. **ENGINEERING GEOLOGY (4).** Pr., junior standing. Rock classification and engineering properties. Stratigraphic sequence, folds, faults, joints, and engineering significance of these features. Formation and transport of soils. Geophysical exploration techniques.
320. **FUNDAMENTALS OF TRANSPORTATION ENGINEERING (5).** Pr., EC 200, CE 201. An introduction to the planning, design and operations of transportation systems: streets and highways, railroads, airports, waterways and pipelines, and mass transportation facilities.
380. **THEORY OF STRUCTURES II (5).** Pr., CE 304. Deflections by moment area and virtual work principles and their application to trusses, beams and frames, under axial force, bending, shear and torsion. Analysis of indeterminate structures by method of consistent deformation, moment distribution, and slope deflection.
400. **ADVANCED SURVEYING AND MAPPING (5). LEC. 4, LAB. 3.** Pr., junior standing. Photogrammetric principles and mensuration are emphasized. Selected topics from map projections, electronic and special instruments: geodesy.
404. **STRUCTURAL ANALYSIS (4).** Pr., CE 380, senior standing. Working stress and ultimate strength theories. Design of structural members in steel, reinforced concrete, and other structural materials. Structural loads. Design criteria and procedures for axial force, bending and shear. Buckling of columns.
405. **WATER AND WASTE WATER TREATMENT (5). LEC. 4, LAB. 3.** Pr., CE 305, junior standing. Theory, design, construction, and operation of water treatment and waste water disposal facilities considered on a unit operations basis. Laboratory includes fundamental tests relating to both water supply and waste water treatment. Emphasis placed on theory and significance of the tests.
406. **INTRODUCTION TO SOIL MECHANICS (5). LEC. 4, LAB. 3.** Pr., CE 301, 315. Physical properties of soils; subsurface investigations; clay mineralogy; soil classification; concept of effective stress; elementary seepage theory; flow nets; consolidation theory; time-settlement analyses; and soil compaction.
408. **ENVIRONMENTAL ENGINEERING DESIGN (5).** Pr., CE 405. The theory and design techniques discussed in CE 305 and CE 405 will be applied to the design of environmental engineering systems. The economics of alternative designs will be considered.
414. **STRUCTURAL STEEL DESIGN (5).** Pr., CE 404. Design and analysis of steel members in tension, compression, shear and flexure, and for combined effects. Elastic and plastic theories. Design of trusses, frameworks, and connections.
415. **CONSTRUCTION PLANNING (5).** Pr., CE 301, junior standing. The construction process as a system; organization of construction engineering functions; financial analysis; cost concepts and elements in pricing; selection and evaluation of construction methods: CPM and PERT.
416. **REINFORCED CONCRETE DESIGN (5).** Pr., CE 404. Concrete properties. Design synthesis and analysis of reinforced concrete beams, slabs, columns and footings.
417. **SOIL AND FOUNDATION ENGINEERING (3).** Pr., CE 304, 406, junior standing. Slope stability; vertical and lateral soil pressures; bearing capacity; foundations.
423. **SIMILITUDE IN ENGINEERING (3). LEC. 2, LAB. 3.** Pr., COI or senior standing. Principles of dimensional analysis and similitude. Aspects of engineering experimentation. Types and uses of models, analogies. Simple applications to engineering problems.
428. **RADIOLOGICAL HEALTH ENGINEERING (3).** Pr., senior standing. Sources and properties of radiation, ionizing effects, biological effects, dosimetry, detection and measurement, design of radiation shielding, decontamination, disposal of wastes, legal aspects of radiation control, public attitudes.
433. **AIRPORT DESIGN (5).** Pr., CE 320, COI, junior standing. An analysis of the elements affecting the design of commercial and general aviation airports including runway configuration, capacity analyses, and geometric design of runways, taxiways and terminal facilities.

480. **CIVIL ENGINEERING MANAGEMENT (5).** Pr., senior standing. The civil engineering manager and his management of engineering personnel, engineering budgets, engineering facilities, engineering design, engineering development and research. Written reports and class presentations of special projects.
490. **SPECIAL PROBLEMS. (CREDIT 1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in civil engineering.

ADVANCED UNDERGRADUATE AND GRADUATE

507. **PUBLIC WORKS ENGINEERING I (3).** Pr., COI. Duties and responsibilities of city engineer, county engineer, and consulting engineer; problems connected with promoting financing, designing and constructing public works.
509. **ENVIRONMENTAL HEALTH ENGINEERING (3).** Pr., senior standing. Application of engineering methodology to communicable disease control, insect and rodent control, milk and food sanitation, industrial hygiene and refuse collection and disposal.
510. **TRANSPORTATION ENGINEERING (5).** Pr., CE 320 and IE 410, or equivalent. Fundamental elements of traffic engineering including traffic and transportation studies, traffic flow theory, intersection design, and traffic surveillance and control systems.
511. **FLOW IN OPEN CHANNELS (5).** Pr., CE 308. Uniform flow, rapidly varied flow, gradually varied flow, subcritical transitions, surges, supercritical transitions, bends, precipitous slopes, energy dissipation, spillways, and oscillatory waves.
512. **OCEAN ENGINEERING FUNDAMENTALS (4).** Pr., COI, senior standing. Hydrodynamic forces on immersed and semi-immersed structures; marine soil mechanics; forces and motion response of offshore structures; seaworthiness of fixed and floating marine structures; structural material selection and performance criteria.
513. **COASTAL ENGINEERING (4).** Pr., junior standing and CE 308 or equivalent. Basic theories of small and finite amplitude water waves, diffraction, reflection, refraction, wind-generated waves and wave prediction procedures; salinity intrusion; effect of waves on coastal structures.
514. **MECHANICS OF SEDIMENT TRANSPORT (4).** Pr., junior standing and CE 308 or equivalent. Sediment properties, incipient motion, fall velocity, effect of bends and meanders, sediment load, stable channel design, erosion and deposition, movement of sediment by waves.
518. **FUNDAMENTALS OF TIMBER AND PRESTRESSED CONCRETE (5).** Pr., CE 416. Properties of timber and prestressed concrete. Design of timber beams, columns, trusses, and connections. Design of plywood decks and forms, and glue laminated members. Design of pre-tensioned and post-tensioned prestressed concrete beams.
519. **PUBLIC WORKS ENGINEERING II (3).** Pr., senior standing. Engineering management of public works projects; engineering problems of urban transportation, communications, water supply, sewerage, streets, schools, shopping parking, and recreation facilities.
520. **SANITARY ENGINEERING LABORATORY (5).** LEC. 4, LAB. 3. Coreq., CE 405. The physical, chemical, and biological aspects of environmental engineering; laboratory testing procedures and experiments relating to the treatment of waters and wastes; interpretation of routine plant control analyses and indices of pollution.
521. **WATER RESOURCES ENGINEERING (5).** Pr., CE 308, senior standing. Environmental significance; hydrologic factors; water laws; water uses; nature, sources and abatement of pollution; quality control measures, planning.
522. **COMPUTER METHODS IN STRUCTURAL ENGINEERING (3).** Pr., CE 380. Principles of matrix formulations of structural problems; force and displacement methods. Algorithms for computer programs for analysis of trusses, beams and frames. Use of computer programs, practical applications.
524. **AIR POLLUTION (5).** Pr., COI, senior standing. The nature, sources and effects of polluting materials including gases, dusts, vapors and fumes and the relations of atmospheric conditions to their dispersal. Introduction to theory and design of air pollution control devices and sampling programs. Legal aspects of air pollution.
525. **SOIL STABILIZATION (3).** Pr., CE 406, or equivalent. Methods of stabilizing soft soil; consolidation, compaction with the use of lime, cement and other additives; construction operations, costs, and field control related to soil stabilization.
527. **FUNDAMENTALS OF WATER SUPPLY AND WASTE TREATMENT (5).** Pr., COI, senior standing. (Not for credit for civil engineering students.) The principles of water supply and waste disposal and the chemistry and biology of water and waste treatment will be presented. Alternatives in water supply and waste disposal will be considered and the theory of treatment operations will be discussed. Laboratory exercises will be conducted.
528. **FUNDAMENTALS OF ADVANCED WATER AND WASTEWATER TREATMENT (3).** Pr., CE 405. (Not for graduate credit for civil engineering students.) The principles of various methodologies for advanced water and wastewater treatment will be discussed. Economic trade-offs and process selection will be emphasized.
530. **FOUNDATION DESIGN AND CONSTRUCTION (5).** Pr., CE 417 (or concurrently). Review of reinforced concrete fundamentals; spread footings; combined footings; mat foundations; piles and pile driving; caissons; cofferdams; dewatering; retaining walls; bulkheads.
532. **GEOMETRIC DESIGN (5).** Pr., CE 320. An analysis of the elements affecting the location and design of rural highways, urban highways, and arterial streets including design controls and criteria, cross-section elements, intersection design, interchange design, and social and environmental considerations.
592. **LINEAR OPTIMIZATION METHODS (5).** Pr., MH 285. Simultaneous linear equations and inequalities, vector spaces, transformation of variables, algorithms of solution or optimization of a linear expression with linear constraints, introduction to error analysis, approximation by linear expressions, separable programming, introduction to game theory.

593. **DISCRETE OPTIMIZATION METHODS (5).** Pr., CE 592. Optimization with discrete-valued variables or combination of discrete and continuous variables. Both deterministic and probabilistic situations to be handled by sequential optimization or networks in graph theory. Adaptations of discrete and continuous variable methods, such as finite differences or integer linear programming.

GRADUATE

602. **ADVANCED SOIL MECHANICS (5). LEC. 4, LAB. 3.** Pr., CE 417 or equivalent. Stress-strain characteristics of soils, stress distribution in soil media, consolidation, shear strength, and bearing capacity, with application to analysis and design of spread footings, rafts, and deep foundations; case studies.
603. **QUANTITATIVE METHODS FOR THE PLANNING PROCESS (5).** Statistical and mathematical tools useful in modern planning analysis. Surveys of various techniques to facilitate decisions in the planning process. Emphasis on the role and evaluation of modern quantitative techniques rather than technical competency.
604. **SEEPAGE THROUGH POROUS MEDIA (5).** Pr., CE 602 or COI. Darcy's Law, soil permeability coefficients, unconfined and confined flow in porous media, methods of solutions, analog methods; numerical and graphical techniques; soil filters, drainage, dewatering, well flow.
605. **SOIL STABILITY PROBLEMS (5).** Pr., CE 604 or COI. Retaining structures including cofferdams, bulkheads, and retaining walls; stability of natural and cut slopes, embankments; earth dam design; methods of field measurements; case studies.
606. **SOIL DYNAMICS (5).** Pr., CE 602, COI. Wave propagations in soils, lumped systems as applied to soil-structure systems, soil properties for dynamic loading conditions; earthquakes, oscillations, and blast loading conditions; analysis and design.
609. **PAVEMENT DESIGN (5).** Pr., CE 425, 602 or COI. Utilization of soils for subgrades, bases, and pavements; composition and thickness design for parking, highway, and airport pavements; stress distribution of wheel loads in layered media; construction procedures; field control tests; cost analysis of pavements.
610. **MODEL ANALYSIS OF STRUCTURES (3). LEC. 2, LAB. 3.** Pr., CE 423 or COI. Structural models. Direct and indirect model analysis of structures. Analogies.
611. **TRANSPORTATION PLANNING (3).** Pr., CE 603 or COI. The transportation planning process; trip generation, forecasting and assignment techniques; goal formulation and analysis of plans.
613. **NUMERICAL METHODS IN HYDROLOGY (3).** Pr., CE 202, 301, 308, MH 362 or COI. Development of the basic matter and energy transport equations for the surface and subsurface hydrologic systems, derivation and solution of numerical approximations by direct and iterative methods with applications to engineering problems.
614. **ENVIRONMENTAL DISPERSION PROCESSES (4).** Pr., CE 308, IE 410, or COI. Classical diffusion theories; longitudinal dispersion and transverse and vertical mixing in free surface turbulent shear flow; applications to natural and man-made channels. Special topics include mixing of heated effluents in natural waterbodies, pollutant flushing in estuaries, and the behavior of submerged axisymmetric and two-dimensional jets.
615. **POROUS MEDIA HYDRODYNAMICS (4).** Pr., CE 604, MH 622, or equivalent. Analysis of fluid flow through porous media, potential flow theory and approximate solutions, conformal mapping, confined flow, unconfined flow, well flow, dispersion.
620. **UNIT OPERATIONS IN WATER AND WASTE TREATMENT (4).** Pr., COI. The theory of various unit operations is developed and the application of these operations to water and waste treatment is considered.
621. **UNIT PROCESSES IN WATER AND WASTE TREATMENT (5).** Alkalinity, acidity, corrosion, chemical precipitation, ion exchange, adsorption, coagulation, disinfection and gas transfer are discussed. Laboratory exercises relating to each topic are performed.
622. **BIOLOGICAL AND ADVANCED WASTE TREATMENT (5).** Pr., COI. Development and application of the theories of biological waste treatment.
623. **INDUSTRIAL WASTE TREATMENT (5).** Industrial waste problems, including the characteristics of individual industries, effects on streams, and methods of treatment and disposal.
624. **WATER RESOURCE SYSTEMS I (5).** Pr., CE 593. Applications of systems methodology to the analysis of problems involving hydrology, surface and subsurface reservoirs, flood forecasting, flood routing and reservoir design and operation.
625. **WATER RESOURCE SYSTEMS II (5).** Techniques such as simulation, linear and dynamic programming and queueing theory applied to pipe networks, open channels, transients in closed conduits, and water supply and waste water treatment systems.
626. **WATER RESOURCES SYSTEMS III (5).** Pr., CE 624, 625. Water quality forecasting and multipurpose river basin development. The current literature will be studied.
627. **ENVIRONMENTAL ENGINEERING CHEMICAL THEORY (4). LEC. 3, LAB. 3.** Pr., COI. The chemistry of natural systems including: equilibrium chemistry of dilute aqueous systems, buffer systems in natural water, thermodynamics, and surface chemistry as related to destabilization, stabilization, sorption and ion exchange properties.
628. **STREAM SANITATION (5).** Pr., CE 621 or COI. Physical, chemical, biological and hydrological considerations relating to the degradation and self-purification of streams and estuaries. Water uses and water quality goals, objectives, and criteria. Principles of water quality modeling and waste-load allocation. The dissolved oxygen balance of aquatic environments will be emphasized. Field studies will be performed.

630. **ADVANCED STRUCTURAL ANALYSIS (5).** Response of structures to complex loadings and support conditions. Shear center, unsymmetrical bending, curved beams. Beams on elastic foundations. Torsion of non-circular sections. Theories of failure. Inelastic theory of structures. Field line theory of slabs.
631. **SPECIAL TOPICS IN STRUCTURES (3-5).** Topics and credit hours may vary, typical of the topics will be: applied elasticity, shell theory, or fatigue and fracture mechanics.
632. **EXPERIMENTAL TECHNIQUES IN STRUCTURAL ANALYSIS (3). LEC. 2, LAB. 3.** Basic theory, techniques and instrumentation for structural testing. Mechanical and electrical strain gages. Brittle lacquer, photogrid, and photoelastic methods. Instrumentation for structural testing.
634. **ADVANCED THEORY OF STRUCTURES (5).** Moment distribution of frames with multiple degrees of freedom. Minimum energy principle, conjugate structure, elastic center, and column analogy methods. Flexural members with varying moments of inertia. Arches and cables. Special topics.
635. **NUMERICAL TECHNIQUES IN STRUCTURAL ANALYSIS (5).** Numerical methods of analysis for structural members of variable section; stiffness factors; stability; vibrations; elastic foundations, beam-columns.
636. **STABILITY OF STRUCTURES (5).** Geometric instabilities in structures; stability theory, elastic buckling of bars and frames; beam-columns; inelastic buckling; buckling of plates, lateral-torsional buckling of beams; buckling of rings and arches.
637. **ADVANCED MATRIX ANALYSIS OF SKELETAL STRUCTURES (4).** Pr., CE 522. Review of displacement and force methods of matrix analysis of structures. Advanced applications to determinate and indeterminate trusses, beams and frames. Yielding of supports, lack of fit and temperature effects. Special topics.
638. **FINITE ELEMENT METHODS IN STRUCTURAL MECHANICS (5).** Pr., CE 637 or COI. Principles of finite element analysis. Variational principles, displacement formulations. Plane stress, plane strain and axisymmetric analyses. Extension to three-dimensional problems. Thermal stresses. Special applications.
639. **STRUCTURAL DYNAMICS (5).** Impact and vibratory loadings; impact analyses; undamped and damped single degree of freedom systems; multiple degree of freedom systems; analyses of structures subjected to blast loadings; earthquake analyses.
641. **ANALYSIS OF STRUCTURAL PLATE SYSTEMS (5).** Analysis of isotropic and anisotropic plates with various shapes and boundary conditions due to lateral and inplane loads. Buckling and large deflections considerations in design included. Numerical techniques for solving plate problems.
642. **OFFSHORE STRUCTURAL SYSTEMS (5).** Structural loads produced by hostile environments, steel and concrete offshore structures, dynamic response, fatigue, fracture, laminar tearing; foundations for permanent and semi-permanent offshore installations; seabed-structure interaction.
660. **CONSTRUCTION APPLICATIONS OF OPERATIONS RESEARCH I (3).** Pr., CE 592 or equivalent, and MH 560 or equivalent. The application of operations research methods to construction engineering; linear programming; deterministic inventory models; replacement, maintenance, and reliability models. Sensitivity analysis.
661. **CONSTRUCTION ENGINEERING FUNCTIONS (3).** Organization of construction engineering functions emphasizing underlying economic principles and phenomena associated with construction engineering projects. Financial analysis, cost concepts and elements in pricing, volume-cost-profit relationships, decision-making models, and legal environment.
662. **CONSTRUCTION APPLICATION OF OPERATIONS RESEARCH II (3).** Pr., CE 660. The application of operations research methods to construction engineering; dynamic programming; probabilistic inventory models; waiting-lines; simulation.
663. **CONSTRUCTION ENGINEERING METHODS (3).** Pr., CE 660, 661. The application of engineering principles to the selection and evaluation of construction methods.
664. **CONSTRUCTION SYSTEMS PLANNING AND CONTROL (3).** Pr., CE 662, 663. The construction process defined as an engineering system. Applicable methods of describing, analyzing, controlling, and manipulating collections of interrelated construction operations treated as a system; techniques of design of construction sub-systems and appropriate evaluation methods.
665. **CONSTRUCTION ENGINEERING ANALYSIS (3).** Pr., CE 662, 663. Quantitative analysis of material handling systems with emphasis on the measurement and forecasting of productivity in construction engineering.
690. **SEMINAR. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
691. **DIRECTED READING IN CIVIL ENGINEERING. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Computer Science and Engineering

Computer Science and Engineering courses are offered by cooperating academic departments; see listing in the School of Engineering, page 153.

Consumer Affairs (CA)

Professor Galbraith

Associate Professors Douty, Hardin, *Head*, Lorendo, and Trentham

Assistant Professors Barry, Boles, Cavender, Clem, Duffield, Foster, Potter, Schultz,
Slaten, and Warfield

Instructors Cross and Watts

105. **FUNDAMENTALS OF CLOTHING (5). LEC. 2, LAB. 8.** Pr., CA 115 concurrently or COI. Basic theories and principles of garment selection and structure, including their application in construction of apparel for personal use.
113. **HOUSING FOR MAN (3).** Housing, equipment and furnishings in terms of the total environment with reference to physical, biological, economic, cultural, and social conditions which affect the family.
115. **CLOTHING AND MAN (3).** Cultural, aesthetic, functional, and technological factors as they interact to determine the meaning and use of clothing and textiles for the individual and society.
116. **ART FOR LIVING I (3). LEC. 3.** A working knowledge of basic concepts in the organization and evaluation of design with emphasis placed upon the contribution of design and color as enrichment of individual and family environment.
- 116L. **ART FOR LIVING LABORATORY (2). LAB. 4.** Pr., CA 116 or concurrently. Provides the opportunity for individuals to explore color and design concepts through the manipulation of materials, tools, and processes and to obtain design evaluation experience.
205. **CLOTHING CONSUMPTION AND SELECTION (3).** Pr., CA 115, CA 116 or equivalent. A survey of the clothing market, consumption problems of consumers and selection of clothing at all stages of the life cycle.
206. **GARMENT STRUCTURES (5). LEC. 2, LAB. 6.** Pr., CA 105 or COI. Theory and application in shaping fabric to human form; construction problems; use of domestic and commercial equipment.
209. **TAILORING (3). LAB. 9.** Pr., CA 105 or equivalent. Principles of fabric selection and tailoring applied in planning and construction of a suit or coat.
216. **ART FOR LIVING II (3-5). (3) LEC. 2, LAB. 2. (5) LEC. 2, LAB. 6.** Pr., CA 116, 116L or equivalent. A continuation of the individual's artistic environment with emphasis on the application of principles of design and color to specific problems of everyday life.
225. **TEXTILES (5).** Pr., CH 203. Polymers, fibers, yarns, fabrics and finishes in their relationship to apparel and household textiles.
226. **FASHION SKETCHING (3). LAB. 6.** Pr., CA 116, 116L or equivalent. Provides for the fashion merchandising or clothing design major simple methods of communicating apparel designs through quick sketches to portray fashion in silhouettes, texture and color.
233. **HOME EQUIPMENT I (5). LEC. 3, LAB. 4.** Home equipment, major and small appliances; emphasis on design, materials and construction, energy requirements, safety standards, operation and maintenance.
303. **THE HOUSE (5). LEC. 2, LAB. 6.** Planned to give the student an appreciation of basic plans, both period and modern, from the standpoint of utility, beauty and economy.
313. **HOME FURNISHINGS (5).** Pr., CA 116 or AT 112 or 121 or equivalent. Home furnishings both from an aesthetic and practical standpoint. This includes the recognition of period furniture and its adaptability to the home of today.
316. **FASHION ANALYSIS (5).** Pr., CA 205. The dynamic nature of fashion and the interacting forces which shape fashion trends in apparel.
323. **MAN THE CONSUMER (3).** Pr., junior standing or COI. All quarters. Management of family resources and consideration of alternatives available to families as consumers. Consumer problems, use of information sources, and analysis of laws protecting consumers.
325. **FASHION MERCHANDISING (5).** Pr., MT 331, 433. Application of principles and practices of merchandising to the retailing of consumer goods and services.
333. **LIGHTING DESIGN (5). LEC. 3, LAB. 4.** Application of functional and aesthetic concepts of lighting design to residential living spaces.
334. **INTRODUCTION TO FIELD EXPERIENCE (2).** Pr., CA 325. Prepares students for maximum utilization of supervised professional field experiences.
335. **FIELD EXPERIENCE IN RETAILING (13).** Pr., CA 325, 334. Three months practical experience with pay in large department store. Students are given formal instruction and supervision. Scheduled only by pre-arrangement.
336. **FIELD EXPERIENCE IN CONSUMER AFFAIRS (5-15).** Pr., departmental approval of application. Supervised practical experience as an employee. Cooperating firm or agency selected with faculty approval.
342. **ANALYTICAL INSTRUMENTATION IN TEXTILES (3). LEC. 2, LAB. 2.** Pr., all Basic Textile courses, TE 241. Use of specialized analytical instrumentation to assist in the production of textile products; as means to solve problems of color mixing, waste water characterization, dust measurement and the identification of materials. Systems control by instrumentation is also included.

343. **INTERIOR HOME PROBLEMS (5).** Harmonious combinations of present day furnishings, materials, and finishes.
345. **CREATIVE CRAFTS (1-2-3). LAB. 2-4-6.** Creative design and execution of a variety of current crafts. Outside research required.
355. **CONSUMER TEXTILES (3). LEC. 3.** Textile fabrics, finishes, and trade practices with special emphasis on consumer problems. Credit will not be allowed for both CA 225 and CA 355.
375. **CREATIVE CERAMICS (1-3). LAB. 9.** Working with various clays, building processes, ceramic glazes, and ceramic design.
385. **CREATIVE WEAVING (3).** Weaving design and experience in selecting yarns, setting up a loom and weaving one's own fabric.
395. **CLOTHING DESIGN (5). LEC. 2, LAB. 6.** Pr., CA 105, 116, 116L, 226, or equivalent or COI. Color, line, form, and texture as a basis for designing apparel, with construction, technological developments, production problems, and fashion movements which influence design decisions.
431. **MAN-ENVIRONMENT RELATIONS (2).** Pr., Home Economics core courses or COI. The unifying principles and ideals, which are concerned with man's immediate physical environment (housing, clothing, food) and with his nature as a social being. Analysis and synthesis of principles explored in Home Economics core courses CA 113, 115, 116, NF 112, FCD 157, and CA 323.
443. **HOME MANAGEMENT RESIDENCE (5).** Pr., CA 113, 115, 116, 323, 431, NF 112, FCD 157, junior standing. All quarters. Residence in the home management house gives actual experience in different phases of homemaking with emphasis placed on the management process, satisfactory group relations, and development of individual initiative.
465. **CERAMICS—ADVANCED CONSTRUCTION AND GLAZING (2-3). LAB. 9.** Pr., CA 375. Advanced construction and glaze techniques emphasizing an individual approach, study of various glazes and glaze properties, mixing and firing of glazes formed from basic chemicals. Independent study under tutorial guidance.
466. **CERAMICS—WHEEL THROWING (2-3). LAB. 9.** Pr., CA 375. Advanced ceramic techniques emphasizing proficiency in wheel throwing, construction, and glazing. Independent study under tutorial guidance.
473. **CONTEMPORARY HOME FURNISHINGS (3). LEC. 1, LAB. 4.** Pr., CA 313, 343. Factors contributing to developments in the current home furnishings industry in design, manufacturing cost, and terminology. A project report is required.
480. **PROBLEMS IN DESIGN. A. CLOTHING; B. TEXTILE DESIGN; C. CLOTHING AND TEXTILE DESIGN (3-5). LEC. 1, LAB. 9-12.** Pr., foundation courses in the field, COI. Creative work integrating methods, materials, and processes in solution of specified design problems. May be repeated and combined for a maximum of 10 hours.
490. **INDEPENDENT OR FIELD STUDY (1-8).** An individual problems course involving directed readings and/or laboratory or field experiences under the direction of a faculty member on some problem of mutual interest. Field experiences may include work with families, business or industry.

ADVANCED UNDERGRADUATE AND GRADUATE

505. **COSTUME DRAPING (5). LEC. 2, LAB. 9.** Pr., 8 quarter hours of clothing construction. Creative experience in development and execution of apparel designs through draping varied fabrics on individualized body structures. Exploration and application of theories, philosophies and practices of contemporary designers.
511. **CLOTHING FOR THE HANDICAPPED AND AGED (2).** Pr., junior standing. The physical, psychological and social facets of selecting, adapting, and designing clothing for the aged and handicapped.
- 511L. **CLOTHING FOR THE HANDICAPPED AND AGED LABORATORY (2). LAB (4).** Pr., CA 105 or equivalent, junior standing; coreq. CA 511. Concepts learned in CA 511 are applied to laboratory problems.
514. **SOCIAL PROBLEMS OF HOUSING (5).** Pr., CA 113 or equivalent, or COI. Current housing policies explored as both causes of and solutions to certain social problems. Zoning and exclusionary practices, public housing, cash subsidies for housing examined.
515. **HISTORY OF TEXTILES (5). LEC. 5.** Pr., AT 171, 172, 173 or HY 101, 102, 103. The development of the textile industry and of fabric design from the earliest times to the present day.
516. **APPAREL QUALITY ANALYSIS (5).** Pr., CA 105 and 325 or equivalent and junior standing. Analysis of quality variations of soft goods and study of factors affecting quality of materials, manufacturing processes, markets and resources.
521. **WORLD APPAREL, TRADE, PRODUCTION, AND DISTRIBUTION (4). LEC 4.** Pr., MT, 440 or equiv., COI. The large textile and apparel manufacturers who have units outside the U.S., foreign apparel companies who have plants in the U.S., international trade agreements and other factors which influence international trade in textiles and apparel.
523. **GOVERNMENT AND THE RETAILERS (5).** Pr., junior standing. COI. Informative, statistical, and regulatory aspects of governmental departments and agencies affecting textiles and clothing retail operations.
524. **PLANNED CHANGE IN THE FASHION INDUSTRY (5).** Pr., CA 325 or COI. The process involved in initiating and implementing change in the fashion industry.
525. **HISTORY OF COSTUME (5). LEC. 5.** Pr., AT 171, 172, 173 or HY 101, 102, 103. Evolution of Western costume from prehistoric time to present day.
530. **CONSUMER ORIENTED LEGISLATION (5).** Pr., CA 323 or COI. Examination of laws involved in consumer protection and resources available for consumers. Use of economic theory and cost-benefit principles in analyzing consumer protection laws.

533. **HOME EQUIPMENT II (5). LEC. 4, LAB. 2.** Pr., PS 200, CA 233, 333. Principles of design, operation and the physical layout of equipment for residential heating, cooling, humidifying, air cleaning; water supply, treatment, and distribution; energy requirements; kitchen, laundry and bath design.
535. **TEXTILE TESTING (5). LEC. 2, LAB. 6.** Pr., CA 225 or equivalent. Standard testing procedures and equipment used in determining the physical and chemical characteristics of fibers, yarns, and fabrics, and of the statistical methods employed in data evaluation.
538. **STUDY/TRAVEL IN CONSUMER AFFAIRS (2-8).** Course may be repeated for a maximum of 12 undergraduate credits or 8 graduate credits. Pr., junior standing. COI. Concentrated study in clothing, textiles, housing, interior furnishings or merchandising in U.S. or foreign locations which offer unique resources for investigation in one of these content areas. Lectures presented at pre-arranged points. Papers required on selected phases of the course.
541. **FAMILY FINANCIAL MANAGEMENT (5).** Pr., CA 323 or COI. Family financial planning, including short-term money management, long-term planning, allocation of family resources, and use of credit.
553. **THE CONSUMER AND THE MARKET (3).** Pr., MT 331 CA 323. Primarily directed toward the needs of students who are preparing for careers in business, industry, and other fields intimately concerned with the consumer and the production and marketing of consumer goods. Examination of the issues and problems in the marketplace from the view-point of both the consumer and the business community.
555. **FLAT PATTERN DESIGNING (5). LEC. 2, LAB. 6.** Pr., 8 quarter hrs. clothing construction. Pattern blocking in personal and commercial pattern production. Foundation sloper developed for pattern drafting. Consideration given to figure variations and their effect on styling and production.
556. **COMPARATIVE METHODS OF APPAREL PRODUCTION (5). LEC. 2, LAB. 6.** Pr., 8 quarter hours of clothing construction. End-use qualities of apparel in relation to options in methods of production and organizational procedures. Implications for consumer decisions and industrial quality control and pricing.
560. **TEXTILE FINISHES (4). LEC. 2, LAB. 6.** Pr., CA 225 or equivalent, junior standing. Chemistry and mechanics involved in finishing textile materials. Properties of finished fabric related to end use.
570. **MANAGEMENT PROBLEMS IN THE HOME (3).** Pr., FCD 270, CA 323. The process of decision-making in families for achieving goals through the effective use of human and material resources. Analysis of case studies and examination of consumer and management problems at all socioeconomic levels.
575. **CREATIVE TEXTILE DESIGN (5). LAB. 9, OUTSIDE WORK TO BE ARR. 6.** Pr., CA 116, 116L, or AT 121. Introductory techniques used in the creative decoration of fabric, with experience in the execution of these techniques for both fashion and interior textiles.
576. **ADVANCED PRINTING AND DYEING (3-3-3). A. DISCHARGE AND RESIST PRINTING; B. BLOCK PRINTING; C. SCREEN PRINTING. LAB. 6.** Pr., CA 575, junior standing. May be repeated for a maximum of 9 credits. Techniques of each type of printing and dyeing studied. Development of designs for hand printing and commercial application. Outside research required.
583. **SOILING AND DETERGENCY OF TEXTILES (5). LEC. 4, LAB. 2.** Pr., PS 200 or COI, CA 225 or equivalent. Physical and chemical principles involved in textile soil deposition and removal. Effect of soil removal methods on functional properties of textile materials.
586. **RUG WEAVING (5). LAB. 15.** Pr., CA 385. Various rug weaving techniques, history, development, use in hand weaving and application to commercial production.
587. **ADVANCED PATTERN WEAVING (5). LAB. 15.** Pr., CA 385. Advanced pattern weaves used in hand weaving and applicable to commercial production.
588. **EXPERIMENTAL WEAVING (5).** Pr., CA 586, 587. Experimental work with yarns, fibers, and related materials, while initiating and solving individual creative problems using advanced weaving techniques. Allows for student interaction and further preparation of portfolio work.

GRADUATE

501. **SEMINAR (1-5). A. CLOTHING; B. TEXTILES; C. DESIGN; D. HOUSING; E. GENERAL.** May be taken more than one quarter in residence for a maximum of 10 credits.
605. **METHODS OF RESEARCH IN HOME ECONOMICS (3).** Pr., BY 501 or EC 274 or 574. Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
609. **SPECIAL PROBLEMS A. CLOTHING, B. TEXTILES, C. TEXTILE DESIGN, D. HOUSING, E. FAMILY RESOURCE MANAGEMENT, F. CONSUMER AND FAMILY ECONOMICS, AND G. HISTORIC COSTUMES AND/OR TEXTILES (2-5).** Pr., COI. May be repeated and combined for a maximum of 15 hours.
610. **ADVANCED DESIGN STUDIO. A. CLOTHING; B. TEXTILE DESIGN; C. CLOTHING AND TEXTILE DESIGN D. HISTORIC COSTUME AND/OR TEXTILES (3-5). LEC. 1, LAB. 5-9.** Pr., foundation courses in the field, COI. Advanced program for synthesizing study and creative work in student's selected field. May be repeated and combined for a maximum of 15 hours.
630. **RECENT RESEARCH IN CONSUMER AND FAMILY ECONOMICS (4).** Pr., EC 551, CA 634, 636, or COI.
631. **READINGS IN FAMILY ECONOMICS AND HOME MANAGEMENT (1-4).** Pr., CA 323, CA 541, EC 200 or COI. Independent readings in family economics and home management.
632. **RESEARCH TECHNIQUES IN HOUSING (5). LEC. 4, LAB. 1.** Pr., statistics and COI. Housing research with particular emphasis on survey methods and data analysis.

633. **FAMILY HOUSING (5). LEC. 5.** Pr., EC 200, SY 201, CA 113 or equivalent. The effects of housing on socio-psychological aspects of the individual and family; economic, legal and social implications; present trends.
634. **THE FAMILY IN THE AMERICAN ECONOMY (4).** Pr., EC 200, 202; CA 323 or COI. Analysis of the family as an economic unit; standards and levels of living; hazards in the family economy. Examination of the economic effect of government policies and programs on the family.
636. **FAMILY RESOURCE DEVELOPMENT AND ALLOCATION (4).** Pr., EC 551, CA 634 or COI. Economic analysis of conditions, programs and policies related to development and use of human and non-human resources, with special reference to impact on families and households.
650. **SOMATOMETRY AND GARMENT STRUCTURES (4). LEC. 2, LAB. 5.** Pr., undergraduate courses in clothing and textiles, COI. Theoretical base of problems involved in building garments. Body contour analysis used to plan pattern adjustments. Management of materials, equipment and processes in garment styling and construction.
652. **CLOTHING AND TEXTILES LITERATURE (5).** A critical examination of the current literature in the fields of clothing and textiles.
653. **ECONOMICS OF CLOTHING AND TEXTILES CONSUMPTION (5).** Pr., EC 200, CA 205 or equivalent. A critical examination of the literature on Clothing and Textiles economics, modern trends in manufacture and distribution and labor laws and their influence on clothing.
658. **CHEMICAL AND PHYSICAL ANALYSIS OF TEXTILES (5). LEC. 3, LAB. 4.** Pr., CH 207. The theory and application of chemical and physical analytical methods to textiles.
659. **FIBER FORMING POLYMERS (5).** Pr., CH 203 or CH 207. The dependence of fiber properties on the chemical formula, the molecular arrangement, and the morphology of polymers. The influence of chemical and physical treatments on polymers and ultimate fiber properties.
662. **PRACTICUM IN CONSUMER AND FAMILY ECONOMICS (2-8).** May be repeated for a maximum of 8 hours of credit. Pr., departmental approval.
667. **CLOTHING AND BEHAVIOR (5).** Pr., basic courses in Sociology, Psychology, and COI. Clothing as a factor in the physical, social and psychological environment of man, his response to and use of clothing as an aspect of individual behavior and culture.
669. **PERSONALITY PROJECTION THROUGH CLOTHING (3).** Pr., CA 667; FCD 610 or PG 433 or equivalent. Psychological processes and theories of personality in relation to clothing-oriented behavior, as supported by research. Emphasis is placed on the interrelationships among the self, the body, and clothing at stages of the life cycle.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Required of all students under the Thesis Option in any field.

Counselor Education (CED)

Professors Meadows, Head, Donnan, Grant, Warner
Associate Professors Allen, Moracco, and Valine
Assistant Professors Byrd, Higgins, McEwen, and Pipes

Prerequisites and corequisites in the Department of Counselor Education are experience in appropriate fields and employment or professional objectives leading to employment in public school counseling, psychoeducational diagnosis (school psychometry) rehabilitation community counseling, counselor education and college student personnel work. CED 621, CED 622, or equivalent, is a prerequisite or corequisite to advanced study.

321. **LEADERSHIP IN STUDENT DEVELOPMENT (3).** Pr., sophomore standing and COI. For students interested in increasing their understanding and skills in group dynamics and leadership. Particular attention will be paid to application of course content and activities to current co-curricular programs in which students are involved.
322. **HUMAN RELATIONS TRAINING IN TEACHER EDUCATION (2).** Students are trained in facilitative communication skills which would lead to (1) a deeper understanding of students and the learning process; (2) a more positive working relationship with peers; (3) more efficient methods of classroom management and conflict resolution; and (4) more effective use of support personnel in the school system.

ADVANCED UNDERGRADUATE AND GRADUATE

521. **INTRODUCTION TO GUIDANCE AND COUNSELING (5).** Emphasizes understanding guidance relationships in the classroom. Not open to graduate students majoring in guidance and counseling.
523. **MEDICAL AND ADJUSTMENT ASPECTS OF DISABILITY I (5).** Pr., COI. Orientation to medical and adjustment aspects of the disabled individual. Understanding and using medical and paramedical personnel effectively in the rehabilitation process.

GRADUATE

621. **PRINCIPLES OF GUIDANCE AND STUDENT PERSONNEL WORK (5).** Enables students to develop a conceptual framework for viewing the inter-relationship of guidance and counseling in terms of (1) personal and social factors and (2) their place in a comprehensive program of student personnel work.
622. **INTRODUCTION TO REHABILITATION COUNSELING (5).** Counseling process in the rehabilitation setting. Focusing also on the historical development, duties, legal background, ethics and the setting.
624. **MEDICAL AND ADJUSTMENT ASPECTS OF DISABILITY II (5).** Pr., CED 523. A continuation of CED 523. Focuses on rehabilitation with the chronically disabled.
625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.
626. **CASE MANAGEMENT IN REHABILITATION COUNSELING (5).** Pr., CED 622 or COI. A critical analysis of representative rehabilitation cases, and case records. Attention is focused on process, diagnosis, and provision of services.
627. **PROBLEMS IN GUIDANCE (5).** Pr., COI. Develops competency in the application of counseling theory and research findings, with special emphasis on educational problems.
628. **COUNSELING THEORY AND PRACTICE I (5).** LEC. 3, LAB. 4. Pr. or coreq., CED 621 or 622. Presents alternative theoretical strategies of counseling; prepares the student for further study of the theoretical and practical aspects of counseling; and provides field opportunities for practical application of theoretical concepts.
629. **COUNSELING THEORY AND PRACTICE II (5).** Pr., CED 628. A continuation of CED 628.
630. **GROUP DYNAMICS IN COUNSELING (5).** Pr., CED 621. Contemporary theories and analysis of concepts, models and pertinent research in group dynamics as it pertains to counseling.
631. **GROUP PROCEDURES IN COUNSELING (5).** Pr., CED 621, 628. The history, philosophy, and principles of group counseling and guidance. Includes pertinent research, and the dynamics of group interaction in counseling settings.
632. **ORGANIZATION AND ADMINISTRATION OF GUIDANCE PROGRAMS (5).** Pr. or coreq., CED 621. For administrative and guidance personnel. Topics discussed include principles of administrative practice, role of staff in regard to the guidance program, organizational patterns for guidance programs, possible ways of initiating a guidance program, and means of evaluation.
633. **ANALYSIS OF THE INDIVIDUAL (5).** Pr. or coreq., CED 621; Pr., PG 515. Assists teachers and other guidance personnel in acquiring knowledge, understanding and skill necessary to obtain records and appraise information about the pupil as an individual and as a member of a group.
634. **COUNSELING IN THE ELEMENTARY SCHOOL (5).** Pr., CED 621. Counseling and related activities are considered in the scope of pupil personnel activities as a developmental process in the elementary school.
635. **AGENCY RESOURCES AND PLACEMENT SERVICES IN REHAB. COUNSELING (5).** Pr., CED 622 or COI. Development and utilization of agency resources of value to the rehabilitation counselor. Emphasis is given to placement services and opportunities in working with the disabled.
636. **VOCATIONAL APPRAISAL (5).** Pr., PG 515 or equivalent and COI. Appraisal of interest, aptitude, and personality tests used in the process of counseling with individuals confronted with vocational decisions. Laboratory practice in test administration, scoring, interpretation, and reporting.
637. **THEORIES OF VOCATIONAL DEVELOPMENT (5).** Pr., CED 621 or COI. Designed to analyze theories of vocational development with special emphasis on the integration and practical application of the theories in counseling. Students are encouraged to examine their own career development in relation to existing theory in order that they may understand the integral role of career counseling within a total system of career education.
638. **INFORMATION SERVICES IN GUIDANCE AND COUNSELING (5).** Pr., or coreq., CED 621 or 626. Assists counselor to develop an understanding of the educational and occupational information service and its relationship to counseling. Emphasis on collection, evaluation and dissemination of all forms of career information. Students experience the process of career decision making through the use of simulated experiences.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
647. **SUPERVISORY PROCEDURES IN REHABILITATION COUNSELING (5).** Pr., AED 670 and COI. Procedures and practices specific to the supervision of rehabilitation counselor and counselor-related services in rehabilitation agencies.
648. **PLANNING AND PROGRAM DEVELOPMENT IN REHABILITATION COUNSELING (5).** COI. Trends in program development, planning, and evaluation of research and theoretical writings in the area. A comprehensive study of research and demonstration projects in rehabilitation counseling.
650. **SEMINAR IN AREA OF SPECIALIZATION (1-5).** Pr., COI. (May be repeated for credit not to exceed 10 hours.) Provides for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
653. **COUNSELING PROGRAMS IN HIGHER EDUCATION (5).** Pr., CED 621. Emphasizes the integration of counseling functions within the total student personnel program in higher education, legal and ethical aspects of counseling and student personnel work, and communication problems between groups within the institution and community.

654. **COLLEGE STUDENT DEVELOPMENT; IMPLICATIONS FOR COUNSELING AND STUDENT PERSONNEL WORK (5).** Pr., IED 663. Emphasis on the developmental characteristics of college students, student culture and environment, student movements, research concerning the diversity of college student population and implications for counseling and student personnel programs.
656. **RESEARCH AND EVALUATION IN COUNSELING (5).** Pr., FED 661. COI. Measurement, appraisal, and evaluation of a broad range of objectives in counseling and guidance. Emphasis on criteria, techniques and research procedures necessary to evaluate counselor programs.
662. **PHYSICAL DIMENSIONS OF COUNSELING (5).** Pr., CED 621 or 622. The physical aspects of the helping relationship, implementation of physical fitness skills to raise the energy level of the helper; use of physical fitness and challenge response activities as a tool in the helping relationship. (This course is also offered as HPR 662.)
695. **PRACTICUM. (1-15).** Experiences relating theory and practice, usually simultaneously.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED).** May be taken more than one quarter.

Economics (EC)

Professors Chastain, Jones, Ritland, Kern, and Steele
Associate Professors Stanaland, Head, Bellante, Hebert, Higgins
M. Jackson, Street, and Whitten
Assistant Professors Deyak, Dunlevy, Holcombe, J. Jackson,
Link, Long, Morrell, Saba, and Zardkoohi
Instructors Garrison, Scott, and Sherling

200. **ECONOMICS I (5).** Pr., sophomore standing. Economic principles with emphasis upon the macroeconomic aspects of the national economy. (Credit not allowed for this course and AEC 202.)
202. **ECONOMICS II (5).** Pr., EC 200. A continuation of economic principles with emphasis upon microeconomic aspects of the economy. (Credit not allowed for this course and AEC 206.)
206. **SOCIO-ECONOMIC FOUNDATIONS OF CONTEMPORARY AMERICA (3).** General elective. The social and economic developments which lead to and help toward an understanding of present day American society.
340. **ENVIRONMENTAL ECONOMICS (5).** Pr., EC 202 or COI. Economic analysis applied to topical environmental issues such as pollution, preservation vs. development, economic growth, and population.
350. **LABOR ECONOMICS (5).** Pr., EC 202, junior standing. A theoretical and institutional examination of the labor market, including wage theories, unionism, the economics of collective bargaining, and problems of insecurity.
360. **MONEY AND BANKING (5).** Pr., EC 200 or AEC 202, junior standing. Money, credit and banking including consideration of monetary systems, foreign exchange and commercial banking with relation to the Federal Reserve System.
433. **LAW AND ECONOMICS (5).** Pr., EC 202 or COI, and junior standing. A description of the many substantive areas in which law has an economic foundation and an analysis of the ways in which law affects economic relations.

ADVANCED UNDERGRADUATE AND GRADUATE

551. **INTERMEDIATE MICROECONOMICS (5).** Pr., EC 202, and junior standing. The theory of pricing under varying market conditions and distribution of income among the factors of production.
552. **COMPARATIVE ECONOMIC SYSTEMS (5).** Pr., EC 202 and junior standing. An analysis of the rival economic doctrines of Capitalism, Socialism, and Communism.
553. **ECONOMICS OF GROWTH AND DEVELOPMENT (5).** Pr., EC 200 and junior standing. Concepts, principles and problems of economic growth and development with consideration of appropriate policies for both underdeveloped and advanced economies.
554. **HISTORY OF ECONOMIC THOUGHT (5).** Pr., EC 202 and junior standing. The development of economic ideas, principles, and systems of analysis from early times to the present.
555. **INDUSTRIAL ORGANIZATION (5).** Pr., EC 202 and junior standing. The relationship of market structure to the pricing behavior of business and industry. Selected topics: regulation, research, and development; technological change.
556. **INTERMEDIATE MACROECONOMICS (5).** Pr., EC 202 and junior standing. The measurement of national output, with income and employment theory, general equilibrium theory, and theories of interest, investment, and consumption.
557. **ECONOMIC HISTORY OF EUROPE (5).** Pr., EC 200 and junior standing. An analysis of the development of the European economy and the resulting impact on the United States and the world.

558. **ECONOMIC HISTORY OF THE UNITED STATES (5).** Pr., junior standing. The evolution of the American economy from European origins to the present.
559. **REGIONAL ECONOMIC DEVELOPMENT (5).** Pr., EC 200 and junior standing. Analytical discussion of the principles associated with the regional development of a national economy. Emphasis is on the problems of lagging regions and on the experience of the United States.
560. **INTRODUCTION TO ECONOMETRICS (5).** Pr., MH 161 or equivalent, AEC 202 or EC 202 or equivalent, and MN 274 or equivalent; junior standing. Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis. (Cross listed as AEC 560.)
562. **INTERMEDIATE MONETARY THEORY AND POLICY (5).** Pr., EC 360 and junior standing. Attention given to theoretical and empirical studies. Readings from original sources required.
565. **PUBLIC FINANCE (5).** Pr., EC 202 and junior standing. An examination of the economic rationale of the public sector; supply and demand of public goods. Principles of efficient and equitable taxation and government spending.
568. **BUSINESS HISTORY OF THE UNITED STATES (5).** Pr., junior standing. The origins and developmental patterns of American business with an emphasis on the role of the business community in the economic and political evolution of the United States. Not for graduate credit for Economics majors.
571. **INTERNATIONAL ECONOMICS (5).** EC 200, 202, and junior standing. An examination of the pure theory and monetary aspects of international trade.
580. **BUSINESS AND ECONOMIC FORECASTING (5).** Pr., EC 556 and MN 574 or COI, and junior standing. Forecasting, with emphasis on the interpretation of macroeconomic forecasting methods and the development of competency in forecasting at the level of the firm.
585. **MATHEMATICAL ECONOMICS (5).** MH 161, EC 551, and 556, and junior standing. An introduction to mathematical methods in economics. Fundamental propositions of micro and macroeconomic theory are derived mathematically.

GRADUATE

501. **FOUNDATIONS OF ECONOMICS (5).** Pr., consent of the Director of Graduate Studies, School of Business. An accelerated course combining both micro- and macroeconomics and implications for the manager.
600. **NATIONAL INCOME AND CAPITAL ACCUMULATION (5).** Pr., EC 551 and 556. Advanced general equilibrium theory. Emphasis on theories of interest, investment, and consumption.
601. **VALUE AND DISTRIBUTION (5).** Pr., EC 551 or COI. Positive content and limitations of modern theories of value, wages, rents, and profits.
607. **REGIONAL AND URBAN ECONOMICS (3).** COI, graduate standing. The economic forces involved in planning a dynamic urban region, the principles of and applications for regional economic models, the role of quantitative models of urban development in metropolitan policy-making.
611. **ECONOMIC DEVELOPMENT (5).** Pr., COI. Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis of financial and technical aid to other countries and case studies of development problems.
622. **THEORY OF WAGES AND LABOR MOBILITY (5).** Pr., EC 350 and 551 or COI. Advanced theories of wage determination and of theories and empirical studies of labor supply and mobility.
650. **ECONOMIC SEMINAR (1-10).** Pr., COI or graduate standing. Intensive study and analysis of economic problems.
651. **BUSINESS CONDITIONS ANALYSIS (3).** Pr., EC 501, MN 574 and 581 or equivalents. Macroeconomic theory as it relates to the business environment and business forecasting.
654. **ADVANCED HISTORY OF ECONOMIC THOUGHT (5).** Pr., EC 554 or COI. Critical survey of classical and neoclassical contributions to economics. Emphasis on the evolution of economic theory and the lessons of history for contemporary analysis.
656. **PRICE THEORY AND BUSINESS APPLICATIONS (3).** Pr., EC 501, MN 570, and 581 or equivalent. Microeconomic theories of the firm and markets and their applications to current business issues.
658. **SEMINAR IN THE ECONOMIC HISTORY OF THE UNITED STATES (5).** Pr., EC 558, COI or graduate standing. Recent developments in the field of knowledge constituting the economic history of the United States.
660. **ECONOMETRICS I (5).** Pr., 551, 560, 565, and MN 574. Probability theory, distribution theory, invariate regression theory, and other problems.
661. **ECONOMETRICS II (5).** Pr., EC 660. Multivariate regression theory, errors in variables, serial correlation, distributed lags, and other problems.
662. **SEMINAR IN MONEY AND BANKING (5).** Pr., EC 360 and COI. Goals, procedures, and achievements in attaining monetary objectives at home and abroad. Special emphasis is given to macro-money models explaining the effects of monetary policy actions on economic activity.
665. **SEMINAR IN PUBLIC FINANCE (5).** Pr., EC 360, 565, or COI. Advanced microeconomic theory of the public sector.

671. **INTERNATIONAL ECONOMICS AND FINANCE (5).** Pr., EC 571. Advanced foreign trade theory and balance of payments analysis, exchange rates, capital movements, financial institutions. Current problems in international finance.
690. **SPECIAL PROBLEMS (1-5).** Variable content in the economics area.
699. **RESEARCH AND THESIS.** Credit to be arranged.

Educational Leadership (EDL)

Professors Walden, Head, Blackburn, Morgan, Phillips, and Tincher
Associate Professors Clark, Ferrante, Krajewski, Martin, Peters, Scebra, and Williams
Assistant Professors Burkhalter and Mayfield

Prerequisites and corequisites in the Department of Educational Leadership are experience in teaching or appropriate fields, and employment or definite professional objectives leading to employment in administration or supervision.

481. **ORGANIZATION AND SUPPORT OF PUBLIC EDUCATION (2).** The organization, administration and financing of American public education.
618. **ORGANIZATION AND ADMINISTRATION OF HIGHER EDUCATION (5).** Pr., EDL 663 or 665. For educational leaders in higher education. The organization, administration, and evaluation of institutions in higher education in terms of the academic program, student personnel services, business affairs, and related programs including relations between higher education and the state and federal government.
625. **INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These will be accompanied by regularly scheduled, on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
645. **CURRENT PROBLEMS AND ISSUES IN EDUCATIONAL ADMINISTRATION (5).** The problems, issues, and trends affecting educational institutions with particular attention to development of administrative procedures to cope with the extensive changes occurring in education.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
649. **THE COMMUNITY COLLEGE PROGRAM (5).** The comprehensive community-junior college designed to improve competencies in program planning, evaluation, and administration.
650. **SEMINAR IN AREA OF SPECIALIZATION (1-10).** Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
663. **THE AMERICAN COLLEGE AND UNIVERSITY (5).** Philosophy and function, the university and social change, the community college, academic freedom, student-faculty-community relationships; international flow of educational ideas, government cultural programs, higher education and the state.
665. **THE COMMUNITY COLLEGE (5).** The rise and development of the community/junior college in American education; its history, philosophy, and functions.
666. **UNDERGRADUATE INSTRUCTION IN HIGHER EDUCATION (5).** Pr., EDL 663 or EDL 665 or COI. The development and selection of appropriate curricular materials and effective teaching strategies. Evaluation of instruction and learning effectiveness in undergraduate programs of higher education.
667. **PROBLEMS OF TEACHING THE marginally PREPARED COLLEGE STUDENT (5).** Pr., EDL 665, 666 or COI. Socioeconomic and cultural backgrounds as they affect learning styles of the marginally prepared student. Develop methods of appropriate teaching strategies as a means of improving the self-concept of these students.

The above courses (663, 665, 666, and 667), along with EDL 618, EDL 697, CED 653, and CED 654, constitute a core for the development of programs of study in higher education. Other offerings, in both academic and professional fields, are available for the completion of advanced programs. These include educational leadership (formerly administration and supervision); foundations of education; psychology; student personnel; vocational and technical education; professional and academic preparation for teaching in agricultural sciences; business administration, economics and sociology, English, health and physical education, history, home economics, mathematics, music, philosophy, physical and biological sciences, and speech.

670. **FUNDAMENTALS OF LEADERSHIP AND SUPERVISION (5).** Introductory studies of the leadership process including such topics as the theoretical framework in which leadership takes place; the purposes, functions and processes of supervision and leadership; administrative and supervisory tasks and skills; and the methods of evaluating leadership and supervisory roles.

- 681. ORGANIZATION AND ADMINISTRATION OF PUBLIC EDUCATION (5).** For superintendents, principals, teachers and other educational leaders. Topics include purposes of organization and administration; organization and administration on federal, state, and local levels; financial support and accounting; operation of plant; school-community interaction and personnel administration.
- 682. ADVANCED APPLICATIONS OF INSTRUCTIONAL SUPERVISION THEORY (5).** Pr. EDL 670. Selection and development of supervisory techniques for improvement of classroom instruction; emphasis on interaction analysis, observation techniques, micro-teaching, team supervision, management by objectives.
- 683. ADVANCED STUDIES OF EDUCATIONAL LEADERSHIP AND SUPERVISION (5).** Pr. EDL 670 or CQI. Current theories, concepts, and principles of leadership and their in-depth application to educational roles. Emphasis is placed on the responsibility of the educational administrator for effective leadership in the school and community, and the responsibility for leadership in the continuous development and evaluation of staff competence and role performance.
- 685. ADMINISTRATIVE ORGANIZATION AND BEHAVIOR (5).** Current theories and concepts of formal organization and of collective behavior. Includes a social-psychological approach to organizations, and treats current trends in organizing for instruction.
- 686. ADMINISTRATION AND POLICY FORMATION (5).** Analysis of basic social forces, antecedent movements, and political action leading to formal enactment of educational policy at national, state, and local levels. Consideration is given to the roles and functions of governing and regulating boards and agencies.
- 688. SCHOOL FINANCE AND BUSINESS ADMINISTRATION (5).** Relationships between educational finance, educational program, tax structures, foundation programs and internal accounting. Theories of public finance and economic principles relating to financial support of educational systems at the local, state and federal levels.
- 689. EDUCATIONAL PLANT MAINTENANCE (5).** Relationship of educational plant maintenance and operation to educational program, procedures in educational plant maintenance and operation; safety factors, trends in modernization and new plant planning.
- 690. EDUCATIONAL BUSINESS MANAGEMENT (5).** Procedures and practices in educational finance at the business or operational level. Attention to budgeting, accounting, purchasing, transportation, cost analysis, and management of human and material resources.
- 691. EDUCATIONAL PLANT PLANNING (5).** Development of educational plants, relationships between curriculum and plant; trends in plant design; analysis of physical conditions, relationships of professional and lay personnel in educational plant planning.
- 692. CONSTITUTIONAL, STATUTORY AND JUDICIAL FOUNDATIONS OF EDUCATION (5).** The constitutional and statutory provisions for education and an analysis of judicial decisions affecting education. Among topics are authority and responsibility of the teacher; rights, privileges and responsibilities of students; use of school property, taxation, curriculum, contracts and retirement provisions; contractual capacity and liability and transportation.
- 693. PERSONNEL ADMINISTRATION (5).** Assists educational leaders with effective personnel administration and the quality of education. Research results and experimentation in morale, welfare, work loads, pupil accounting, and bases for salary determination as they relate to staff and pupil personnel.
- 694. STUDIES FOR COMPREHENSIVE EDUCATIONAL PLANNING (5).** Principles and procedures for collecting, analyzing, and utilizing data in the process of educational planning, including such topics as: community characteristics, including power structure; economic bases and population; system characteristics, including administrative organization, finance, personnel physical facilities; and instructional program.
- 695. PRACTICUM. (1-15).** Students get experiences closely relating theory and practice, usually earned on simultaneously.
- 697. STUDENT PERSONNEL WORK IN HIGHER EDUCATION (5).** Pr. CED 621. Theories, principles, practices, organization, administration, and evaluation of student personnel services in higher education.
- 698. CLINICAL SUPERVISION OF INSTRUCTION (5).** Pr. EDL 670, EDL 682. Theory of instruction; principles and process of clinical supervision; development of readiness for both the clinical supervision concept and implementation of clinical supervision techniques. Role playing and theoretical applications of clinical supervision will be effected.

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

- 699. RESEARCH AND THESIS** (Credit to be arranged). May be taken more than one quarter.
- 798. FIELD PROJECT.** (Credit to be arranged.) May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION.** (Credit to be arranged.) May be taken more than one quarter.

Educational Media (EM)

Associate Professors Bush, Head, Miller, Smith, and Wright
Assistant Professors Mohajerin and Nist
Instructor Anthony

The program in Educational Media provides certificate endorsement as school librarian, and certification as media specialist. Basic courses may be elected by majors in other areas.

200. **EDUCATIONAL MEDIA (2). LAB. (4).** Basic principles of library/media center usage includes audiovisual equipment operation, production of basic AV materials, and retrieval and utilization of library materials.
300. **LEARNING RESOURCES (1-5).** May be repeated to include areas A, B, C, and D. A. Survey of learning resources (2). B. Production of materials. (1). C. Planning learning situations (1), and D. The school media program (1).

ADVANCED UNDERGRADUATE AND GRADUATE

510. **MEDIA FOR CHILDREN (4).** Evaluation of print and other types of materials in view of the needs and interests of various age and grade levels of elementary school children. Study of selection aids, principles, and criteria for selecting materials.
515. **MEDIA FOR YOUNG ADULTS (4).** Evaluation of books and other media in relation to the interests, needs, and abilities of young adults.
530. **REFERENCE MATERIALS AND SERVICES (4).** Evaluation of basic reference sources for learning resource centers. Introduction to research methods needed in locating information to support the curriculum of the school.
540. **ORGANIZATION AND ADMINISTRATION OF MEDIA CENTERS (4).** Pr., EM 300. Basic organization of books, non-book materials, and services for effective use in media centers. Administering the budget, selection and purchase of materials, preparation of materials for use, circulation of materials, inventory, care and repair of materials, and instruction in the use of media are considered.
550. **CLASSIFICATION AND CATALOGING OF MEDIA (4).** Pr., EM 300, 510, or 515, 530, and 540. Principles and procedures of classifying and cataloging books and other printed materials, filmstrips, recordings, and community resources. The vertical file, the Dewey decimal system of classification. Wilson and Library of Congress printed cards, and subject headings are studied.
570. **CYBERNETIC PRINCIPLES OF LEARNING SYSTEMS (4).** The organization of mediated instruction into learning systems designs utilizing feedback control and modification. Includes implications for instructional strategies formed to function in the continuous progress school with special emphasis on the media center.

GRADUATE

600. **TECHNOLOGY IN EDUCATION (4).** Pr., EM 300 or equivalent. Theory, problems, and procedures in the utilization of technology for the design of instruction to meet specific learner needs.
605. **MODES OF MEDIATED INSTRUCTION (4).** Pr., EM 600. Development and integration of media prescriptions. Emphasis is on the selection of appropriate media for specific learning tasks.
620. **PRINCIPLES OF MEDIA SERVICES (4).** Pr., EM 600 or COI. The place and function of media in American education including the individual school, district and region. Organizing media teachers and students as an integral part of the school program; standards, policies, and long-range plans are included.
625. **INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods to provide positive evaluation and analysis of the intern experience.
626. **PROBLEMS IN THE ADMINISTRATION OF MEDIA SERVICES (4).** Pr., EM 605, 620, or COI. Current problems relating to an effective program of media services. Experiences include problem identification and resolution in the field.
630. **INFORMATION RESOURCES IN THE SCHOOL AND COMMUNITY (4).** Pr. or corequisite, EM 600. Specific concepts and problem-solving techniques for school media center relations with the community. Emphasis on systems approach to problem-solving in media management.
646. **DIRECTED INDEPENDENT STUDY. (1-10).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN EDUCATIONAL MEDIA (1-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and/or theoretical formulations.
651. **RESEARCH STUDIES IN EDUCATIONAL MEDIA (4).** Pr., FED 661 and 18 hours of appropriate media courses including EM 600 or equivalent. Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
654. **EVALUATION OF PROGRAM IN EDUCATIONAL MEDIA (4).** Pr., FED 661 and 18 hours of appropriate media courses including EM 600 or equivalent. Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
695. **PRACTICUM (1-15).** Experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS (Credit to be arranged.)** May be taken more than one quarter.
798. **FIELD PROJECT. (Credit to be arranged.)** May be taken more than one quarter.

Electrical Engineering (EE)

Professors Irwin, *Head*, Honnell, C. Carroll, Graf,

Haeussermann, Lowry, Phillips, and Russell

Alumni Professor Nagle

Associate Professors Barnes, Boland, B. Carroll, Cook, Feaster, Gross, Kerns, Rogers,
Shumpert, and Slagh

Assistant Professors James and Starks

201. **INTRODUCTION TO ELECTRICAL ENGINEERING (3).** Pr., sophomore standing. The electrical engineer and his contribution to society; the digital computer as an electrical engineering tool; programming solutions to electrical engineering problems.
202. **TIMESHARING AND TERMINAL SYSTEMS (2).** Not open to EE majors. Time-shared computer systems, remote terminals, terminal languages, and system applications.
261. **LINEAR CIRCUIT ANALYSIS I (3).** Coreq., PS 222, MH 265. Basic laws and concepts; resistive circuits, linear algebra, R-L and R-C circuits.
263. **LINEAR CIRCUIT ANALYSIS II (4).** Pr., EE 261. Coreq., EE 264 for EE students. Sinusoidal forcing functions and phasors; steady-state response, average power and RMS values, polyphase circuits, Fourier analysis, and magnetically coupled circuits.
264. **LINEAR CIRCUIT ANALYSIS II LABORATORY (1).** LAB. (3). Coreq., EE 263. Experiments in electrical circuits.
300. **FUNDAMENTALS OF ELECTRICAL ENGINEERING (5).** Coreq., MH 265, PS 222. An introduction to the fundamental concepts of electrical engineering with emphasis on topics in circuits, electronics, and energy conversion. (Not open to Electrical Engineering majors.)
301. **ENGINEERING INSTRUMENTATION (3).** LEC. 2, LAB. 3. Pr., EE 263. Principles of instrumentation. The detection and measurement of physical quantities with emphasis on transducers, signal processing, and display.
330. **ANALYSIS AND DESIGN OF LOGIC CIRCUITS (4).** LEC. 3, LAB. 3. Pr., EE 201, junior standing, or COI. Binary numbers; Boolean algebra, Boolean functions, truth tables and Karnaugh maps; Gates and flipflops; combinational and sequential logic circuits; design methods and design verification; logic families and logic technologies.
335. **COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE PROGRAMMING (4).** LEC. 3, LAB. 3. Pr., EE 330. Stored program computers, hardware components, software components, data representation and number systems; instruction sets, addressing modes, and assembly language programming; subroutines and macros; assemblers; loaders, linkers, and operating systems; memory, memory cycle and memory hierarchy; arithmetic/logic unit; control unit, program counter, and instruction cycle; input/output, input/output programming, and interrupts.
351. **LINEAR FEEDBACK SYSTEMS (4).** Pr., EE 362. Transfer functions, transient and steady state performance, stability, design and compensation of feedback control systems.
352. **NONLINEAR AND SAMPLED-DATA SYSTEMS ANALYSIS (4).** LEC. 3, LAB. 3. Pr., EE 351. Describing functions; phase plane analysis; sampled-data systems; use of state space concepts.
362. **LINEAR SYSTEMS (5).** LEC. 4, LAB. 3. Pr., MH 266, EE 263, 264. Fourier Series, Fourier transforms, Laplace transforms, state space analysis.
371. **ELECTRONICS I (3).** Pr., EE 263 or 300. Semiconductors, principles of electronic devices, design of low frequency electronic circuits.
374. **ELECTRONICS II (4).** Pr., EE 371. Integrated circuits, high frequency limitations of electronic devices, frequency response, feedback, design of high frequency and feedback electronic circuits.
385. **POWER SYSTEM ANALYSIS I (4).** Pr., EE 263 or 300. Basic power system terminology. Synchronous machines, transmission lines, and transformer system models. Symmetrical components and load flow analysis.
391. **ELECTROMAGNETICS I (3).** Pr., PS 222. Scalar and vector fields, the electrostatic field, the magnetostatic field, Maxwell's equations, boundary conditions.
392. **ELECTROMAGNETICS II (3).** Pr., EE 391. Energy and power relations for the electromagnetic field, time varying fields, plane waves, theory and application of guided waves.
397. **INTRODUCTION TO ACOUSTICS AND NOISE CONTROL (3).** Pr., MH 265 or COI. Acoustical terminology and units, acoustic wave equation, propagation of sound waves, psychoacoustics, microphone and loud speakers, basic sound measurements and analysis, noise control.
430. **COMPUTER SYSTEM DESIGN (4).** LEC. 3, LAB. 3. Pr., EE 335. Computer I/O, I/O hardware, programmed I/O, interrupts, DMA, and I/O programming; microprocessors, support chips, peripherals, and programming; system specification, design, and verification.
441. **COMMUNICATION THEORY (5).** LEC. 4, LAB. 3. Pr., EE 475, IE 311. Spectral analysis. Amplitude, angle and pulse modulation, and demodulation techniques.
475. **ELECTRONICS III (5).** LEC. 4, LAB. 3. Pr., EE 330, 374. Oscillators, IC operational amplifiers, linear analog systems, nonlinear analog systems, IC logic families, power circuits.

- 481. **ELECTROMECHANICAL ENERGY CONVERSION (5).** Coreq.: EE 385. Basic concepts in electromagnetic-mechanical energy conversion. Linear and nonlinear analysis of transformers, dc machines, synchronous, and induction machines. Operation in the generator and motor modes.
- 489. **ELECTROMECHANICAL ENERGY CONVERSION LABORATORY (2).** LAB. 6. Coreq.: EE 481. Experiments involving electromechanical energy conversion devices.
- 490. **SPECIAL TOPICS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
- 492. **ELECTROMAGNETICS III (4).** LEC. 3, LAB. 3. Pr., EE 392. Continuation of guided waves; introduction to radiating systems; coordinated laboratory demonstrations and experiments.
- 499. **SPECIAL PROJECTS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.

ADVANCED UNDERGRADUATE AND GRADUATE

- 520. **FUNDAMENTALS OF COMPUTER GRAPHICS SYSTEMS (4).** LEC. 3, LAB. 3. Pr., EE 324, 425, IE 300 or the equivalent, COI. Hardware and software components of computer graphics systems; display files, two-dimensional and three-dimensional transformations, clipping and windowing, perspective, hidden-line elimination and shading; interactive graphics; survey of applications.
- 521. **INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND ROBOTICS (4).** LEC. 3, LAB. 3. Pr., EE 526 or 527. Software and hardware pertaining to the design of intelligent computer systems. Problem representation, game playing, State space search techniques, problem reduction search techniques, Mini-Maxing-Alpha Beta Pruning; sensors, transducers optics; automatic controllers, numeric controller machines, industrial and research robots.
- 523. **FAULT DIAGNOSIS OF DIGITAL SYSTEMS (3).** Pr., EE 430 and COI. Fault testing for combinational and sequential logic circuits, fault models, test generation, diagnosis of logic systems, implications in design.
- 524. **MICROCOMPUTERS (4).** LEC. 3, LAB. 3. Pr., EE 430 or COI. Microcomputer chip sets, microcomputer system design, machine programming, PROM programming, interfacing, applications, bit-sliced microprocessors, advanced microprocessor/microcomputer architectures.
- 526. **MINICOMPUTER LABORATORY (1).** LAB. 3. Pr., EE 201 or equivalent, Pr., EE 335. Students learn to program and operate a typical minicomputer system. Programming is done in MACRO assembly, in BASIC and in APL in the time sharing mode. FORTRAN—assembly language linkage techniques and peripheral driver routines.
- 527. **SYSTEMS PROGRAMMING AND OPERATING SYSTEMS (3).** Pr., EE 335, and COI. An introduction to assembly languages, assemblers, macro processors, loaders, higher level languages, and operating systems.
- 528. **COMPILER CONSTRUCTION (3).** Pr., EE 527. Review of language structures, system programs, and storage allocation, Compilation of statements and expressions. Compiler organization, symbol tables, scanning, object code generation, diagnostics, code optimization, compiler writing languages, and bootstrapping.
- 530. **COMPUTER ENGINEERING SEMINAR (1).** Pr., COI. May be repeated for credit but no more than one hour can be applied to a master's degree or more than three hours to a doctoral degree. Invited speakers, faculty, and graduate students present results of their research activities.
- 543. **COMMUNICATION SYSTEMS (3).** Pr., EE 475. Impedance matching, filtering, transmitters and receivers, telemetry, radar, image transmission, lasers.
- 547. **INTRODUCTION TO DIGITAL SIGNAL PROCESSING (5).** Introduction to digital filters, the discrete Fourier Transform, and their applications in signal processing.
- 549. **ELECTRICAL METHODS IN BIOMEDICAL ENGINEERING (3).** Pr., EE 362 or COI. Basic electrophysiology, models of synaptic and axonal nerve transmission, action potentials, neuronal specificity, electrical engineering methods, laboratory demonstrations.
- 551. **HYBRID COMPUTATION (5).** LEC. 4, LAB. 3. Pr., EE 352. Analog computer simulation of physical systems; logic control of analog computers; digital computer simulation of physical systems; hybrid computation; use of the computer as a design tool.
- 553. **AC CARRIER CONTROL SYSTEMS (3).** LEC. 2, LAB. 3. Pr., EE 351, 481. Modulation theory; AC carrier control system components; analysis and design of AC carrier control systems.
- 564. **INTRODUCTORY NETWORK SYNTHESIS (3).** Pr., EE 362. Introduction to the synthesis of passive networks, with emphasis on driving point functions.
- 565. **ADVANCED CIRCUIT ANALYSIS (3).** Pr., EE 362. Matrix analysis of circuits; network parameters; three and four terminal networks; special topics.
- 570. **ELECTRICAL PROPERTIES OF MATERIALS (3).** Pr., EE 392, PS 320. Studies of the electrical properties of materials with emphasis on semiconductors.
- 571. **PHYSICAL ELECTRONICS (3).** Pr., EE 570. Physical properties of electrical and electronic devices.
- 572. **MICROELECTRONICS (3).** Pr., EE 374. Monolithic integrated circuit technology, thick and thin film hybrid circuits, fabrication and applications.
- 574. **INTRODUCTION TO NOISE IN ELECTRONICS (3).** Pr., EE 374, 392, PS 320. Noise in solid state devices and circuits, low noise circuit design, noise characterization, and computer-aided noise analysis.
- 575. **LINEAR INTEGRATED CIRCUIT DESIGN (3).** Pr., EE 374. Design of analog circuits; current sources, input/output stages, gain stages, multipliers, multiplexers, phase-locked-loops active filters.

- 576. **DIGITAL INTEGRATED CIRCUIT DESIGN (3).** Pr., EE 374. Design of digital integrated circuits, applications, solid state device switching characteristics, memory, displays, testing.
- 582. **POWER ELECTRONICS (3).** Pr., EE 481 or COI. Polyphase power rectifiers and inverters. Solid state drives for rotating machines. Characteristics of high power solid state components.
- 585. **POWER SYSTEM ANALYSIS II (3).** Pr., EE 385 or COI. Symmetrical components and analysis of unbalanced faults on power systems. Relay and protection schemes.
- 586. **DIRECT ENERGY CONVERSION (3).** Pr., EE 481, 391, ME 301, or COI. Fundamentals and energy consideration, thermoelectric devices, photovoltaic devices, thermionic devices, magnetohydrodynamic power generation, batteries and fuel cells. Ecological consideration.
- 587. **MATRIX ANALYSIS OF ELECTRICAL MACHINES (3).** Pr., EE 481. Matrix algebra, linear transformations, symmetrical components; the generalized machine; direct current machines; induction machines; synchronous machines.
- 588. **POWER SYSTEM RELIABILITY (3).** Pr., MH 266, EE 385, or COI. Reliability techniques applied to the planning and design of generation, transmission, and distribution facilities of electrical power systems.
- 594. **ELECTROMAGNETIC PROPAGATION (3).** Pr., EE 492. Principles of wave propagation in communication systems. Study of propagation modes. Introduction to interaction of electromagnetic waves and plasmas.
- 595. **MICROWAVES (3).** Pr., EE 492. Analysis of distributed systems including waveguides and transmission lines, generation and detection of microwave energy, coordinated laboratory experiments and demonstrations.
- 596. **ANTENNAS (3).** Pr., EE 492. Analysis of radiating systems, to include individual radiators and antenna arrays, impedances in radiating system design, antenna performance measurement techniques, coordinated laboratory experiments and demonstrations.

GRADUATE

- 601. **LINEAR ANALYSIS (5).** Methods of analysis, the exponential forcing function, Fourier series, Fourier transform, Laplace transform, and superposition integrals. Complex variables and contour integration.
- 610. **ADVANCED TOPICS IN ELECTRICAL POWER SYSTEMS (5).** Pr., EE 585, or COI. Power system transients, economic dispatch, Optimum operation of power systems, HVDC, the governor-exciter-generator system.
- 612. **ADVANCED TOPICS IN ELECTROMECHANICAL ENERGY CONVERSION (5).** Pr., COI. Dynamic equations of motion of electromechanical systems; the generalized rotating electromechanical energy converter; dynamics of systems; the n -m symmetrical machine.
- 620. **NONDETERMINISTIC SYSTEMS ANALYSIS (3).** Pr., COI. Applications of probability, random variables, and stochastic processes in Electrical Engineering.
- 621. **SWITCHING THEORY I (4).** Pr., EE 330 or equivalent. Special topics in switching theory and digital design. Multiple level circuits, decomposition, threshold and multiple-valued logic, linear sequential circuits, and issues in asynchronous sequential circuit design.
- 622. **SWITCHING THEORY II (4).** Pr., EE 621 or equivalent. Algebraic structure of sequential machines; modular logic design, universal logic modules, array realizations, programmable logic arrays, physical circuit design, partitioning, placement, routing; magnetic bubble logic, fault diagnosis, fault-tolerant design.
- 623. **CODING THEORY (3).** Pr., EE 330. Error detection and correction, linear codes, cyclic codes, BCH codes, coding bounds, shift register sequences, and coding systems.
- 626. **DIGITAL COMPUTER ARCHITECTURE I (3).** Pr., EE 430, or equivalent. Structures for the central digital computer are studied; arithmetic units, machine language features, information transfer, memory hierarchy, channels.
- 627. **DIGITAL COMPUTER ARCHITECTURE II (3).** Pr., EE 626. Parallelism in hardware and software, High speed processors, multiple machines, multiprogramming, and multiprocessing.
- 636. **COMPUTER NETWORKS AND DATA COMMUNICATIONS (3).** Pr., EE 430 or COI. Introduction to distributed systems, network architectures, protocols, digital communication links, data management, and related software design.
- 640. **DIGITAL COMPUTING SYSTEMS (3).** Pr., EE 626. Present and next generation digital computers; minicomputers, multiprocessors, business and scientific oriented models; diverse uses of digital computers today, future trends and applications for digital computers.
- 641. **LINEAR NOISE THEORY (5).** Pr., EE 620 or COI. Probability, noise processes, correlation, power spectra, noise through linear systems, matched filters, Wiener filters, prewhitening, parameter optimization.
- 642. **FAULT TOLERANT COMPUTING (3).** Pr., EE 523, 623 or COI. Architecture and design of fault tolerant computer systems using protective redundancy, estimation of the reliability and availability of fault tolerant systems, error recovery, and fault diagnosis.
- 643. **COMPUTER SOFTWARE DEVELOPMENT (3).** Pr., EE 527, or equivalent. Programming systems and languages, interactive systems, philosophy of operating systems, program-program interfaces, problems in data management, software maintenance and reliability.
- 644. **THEORY OF COMPILERS (3).** Pr., EE 528, or equivalent. Formal properties of grammars, syntactic analysis, lexical analysis, analytical modeling, macro generators, code selection, hard-wired compilers, and extensible languages are typical topics studied.

645. **DETECTION, ESTIMATION AND MODULATION THEORY (5).** Pr., EE 641 or COI. Hypothesis testing, parameters in Gaussian noise, estimation of continuous waveforms, linear estimation.
646. **ARTIFICIAL INTELLIGENCE AND PATTERN RECOGNITION (3).** Pr., EE 521. Heuristic Programming, LISP, Correlation methods, discriminant analysis, maximum likelihood decisions, minimax techniques, perception-like algorithms, features, extractions, pre-processing, clustering and unsupervised learning.
647. **THEORY OF DIGITAL SIGNAL PROCESSING (5).** Pr., EE 547. Finite and infinite impulse response digital filters, finite word length effects, two dimensional signal processing hardware schemes and applications.
- 650-651-652. **ELECTROMAGNETIC THEORY AND APPLICATIONS I-II-III (5-5-5).** Pr., COI. A three-course sequence for students specializing in electromagnetics.
653. **ANTENNAS (5).** Pr., COI. Advanced treatment of radiating systems.
656. **NETWORK SYNTHESIS (5).** Pr., EE 601. Two-terminal passive networks; properties, realizability, and principles of synthesis. Conventional and modern filter synthesis.
670. **INFORMATION THEORY (3).** Pr., COI. Signal descriptions; spectral representation; random variables and processes; information measures; channel models; coding theorems.
671. **SOLID STATE ELECTRONICS I (3).** Pr., EE 570 or COI. Transport properties of semiconductors, band structure, carrier lifetime, current flow, junction theory.
672. **SOLID STATE ELECTRONICS II (3).** Pr., EE 571 or COI. Advanced physical theory of pn junctions and bipolar junction transistors, modeling theory, high level injection effects, large signal analysis, and second order effects.
- 673-674. **COMMUNICATION SYSTEMS I-II (3-3).** Pr., COI. RF circuitry; impedance matching networks; oscillators; mixers; modulators; detectors; RF amplifiers; high frequency devices, integrated subsystems; testing and measuring techniques in RF systems.
675. **ANALOG ELECTRONIC CIRCUITS (3).** Pr., COI. Analysis, design, and application of discrete and integrated electronic devices in analog circuitry. Amplifiers; active filters; integrators; multipliers; dividers; logarithmic converters. Speed capability and noise considerations.
677. **ELECTRONIC SWITCHING CIRCUITS I-II (3-3).** Pr., COI. Analysis, design, and application of discrete and integrated electronic devices in switching circuitry. Wave shaping; integrated circuit logic families; gating; wave generation; counting; timing; memory.
679. **SOLID STATE ELECTRONICS III (3).** Pr., COI. Advanced theory of field effect devices.
680. **DIRECTED READING IN ELECTRICAL ENGINEERING. CREDIT TO BE ARRANGED.**
- 681-682-683. **AUTOMATIC CONTROL THEORY I-II-III (4-4-3).** Pr., COI. Advanced analysis and design of control systems, including modern and classical control theory as applied to linear, nonlinear, continuous, and discrete systems.
690. **SPECIAL TOPICS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
- 691-692-693. **ADVANCED AUTOMATIC CONTROL THEORY I-II-III (3-3-3).** Pr., COI. Optimal control theory for deterministic and non-deterministic systems; optimal linear filter theory; modern stability theory.
695. **SEMINAR. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
698. **SPECIAL PROJECTS. CREDIT TO BE ARRANGED.** Pr., COI. May be taken more than one quarter.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Elementary Education (EED)

Professors Coss, Head, Cadenhead, and Newell

Associate Professors Allen, English, Kaplan, Noland, Wilson, and Wright
 Assistant Professors Jensen, Koon, Silvern, vonEschenbach, and Williamson
 Instructor Schillings

Orientation

102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
104. **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).** Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.

Reading Improvement

Available as a service course and as a general elective to all University students.

310. **READING IMPROVEMENT (3). LEC. 2, LAB. 2.** General elective. Developmental reading for students who wish to improve their reading skills. Each student's present degree of reading efficiency is diagnosed and a program structured to his individual needs is planned and conducted.

Curriculum and Teaching

Students are sectioned by area of specialization according to the following designations in certain core courses: (A) Early Childhood Education, (B) Elementary Education, (C) Special Education-Behavior Disturbance, (D) Special Education-Mental Retardation, (E) Special Education-Early Childhood Education for the Handicapped.

300. **FUNDAMENTALS OF READING INSTRUCTION (5). LEC. 3, LAB. 4.** Pr., sophomore standing. Develops competencies in teaching reading skills. Readiness, word recognition, and comprehension will be stressed.
301. **CURRICULUM I (10). LEC. 8, LAB. 6.** Pr., EED 300, coreq. FED 214, admission to Teacher Education, junior standing. Understandings, skills, and attitudes necessary for planning and implementing language arts and social science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.
302. **CURRICULUM I, LANGUAGE ARTS (5).** Pr., EED 300, admission to Teacher Education, junior standing.
303. **CURRICULUM I, SOCIAL SCIENCE (5).** Pr., admission to Teacher Education, junior standing.
304. **MUSIC AND RELATED ARTS (5).** Pr., junior standing. Musical, rhythmic, and artistic activity program in the context of laboratory experiences with children.
320. **CURRICULUM FOR EARLY CHILDHOOD EDUCATION I (10). LEC. 8, LAB. 6.** Pr., coreq., FED 214, junior standing. Language Arts and Social Science curricula appropriate for children ages four through eight. Laboratory experiences are required.
396. **MUSIC FOR THE ELEMENTARY TEACHER (3). LEC. 2, LAB. 2.** Pr., COI. An elective for Elementary Education of Music Education students. The design of curricula and teaching strategies in grades K-6; includes laboratory experience with children in a public school.
401. **CURRICULUM II (10). LEC. 8, LAB. 6.** Pr., coreq. FED 320, junior standing. Understanding, skills, and attitudes necessary for planning and implementing elementary mathematics and natural science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.
402. **CURRICULUM I, MATHEMATICS (5).** Pr., junior standing.
403. **CURRICULUM II, NATURAL SCIENCE (5).** Pr., junior standing.
420. **CURRICULUM FOR EARLY CHILDHOOD EDUCATION II (10). LEC. 8, LAB. 6.** Pr., EED 320, coreq., FED 320. Mathematics and natural science curricula appropriate for children ages four through eight. Laboratory experiences are required.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship; appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
451. **ANALYSIS OF ELEMENTARY INSTRUCTIONAL STRATEGIES (3). LEC. 2, LAB. 2.** Pr., Professional Internship. Patterns of elementary curriculum and organization for instruction, including the analysis of previous and current laboratory experiences in education. Attention given to implementation of systems approach in student's area of specialization.
455. **ANALYSIS OF EARLY CHILDHOOD EDUCATION PROGRAMS (3). LEC. 2, LAB. 2.** Pr., EED 420 and Professional Internship. Curriculum and organization of early childhood programs are evaluated. Previous and current laboratory experiences are related to current trends in early childhood education. Laboratory activities will be coordinated by the faculties in the Department of Elementary Education, and Family and Child Development.
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE

561. **INDIVIDUALIZING THE CLASSROOM READING PROGRAM (5). LEC. 3, LAB. 4.** Pr., EED 300. Helps develop competencies in the use of diagnostic and prescriptive techniques of teaching reading. Strategies for individualizing the classroom reading program will be stressed.

570. **READING IN THE CONTENT AREAS IN THE ELEMENTARY SCHOOL (5).** LEC. 3, LAB. 4. Pr., EED 300. Develops competencies in teaching functional reading in the elementary school. Directed reading activities, specialized skills, and study skills stressed.
574. **PROBLEMS IN IMPROVEMENT OF READING AT THE ELEMENTARY SCHOOL LEVEL (5).** LEC. 3, LAB. 4. Pr., EED 300. Develops competencies in teaching functional reading in the elementary school. Directed reading activities, specialized skills, and study skills stressed.
596. **MUSIC IN THE ELEMENTARY SCHOOL (5).** Insight into skills, techniques, and knowledge of music. Appropriate materials, adapted to social and musical interests of children, are studied and evaluated.
597. **ORGANIZATION OF ELEMENTARY SCHOOL MUSIC (3).** Pr., EED 304 or IED 423. Theory and development of the music program in the elementary school.

GRADUATE

620. **THE EARLY CHILDHOOD EDUCATION PROGRAM (3-10).** Pr., bachelor's degree. Curriculum, teaching-learning process, materials, and facilities appropriate for young children will be studied in a laboratory environment.
621. **CURRENT TRENDS IN EARLY CHILDHOOD EDUCATION (5).** Pr., EED 620 or bachelor's degree in Early Childhood Education. Developments, issues, and trends in early childhood education curriculum.
622. **SEMINAR IN EARLY CHILDHOOD EDUCATION (3-10).** Pr., EED 621. May be repeated for credit not to exceed 10 hours. Contemporary problems in early childhood education. Intensive study in areas of interest and need.
624. **RESEARCH IN EARLY CHILDHOOD EDUCATION (5).** Pr., EED 621. Review, analysis, and interpretation of research in areas of early childhood education.
625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.
641. **DIAGNOSTIC PROCEDURES IN READING (5).** Pr., EED 461 or consent of department head. Administration, scoring and interpretation of specific reading tests to determine causes of reading disability. Formal and informal evaluation procedures for regular and remedial classrooms. Screening tests for contributing factors to reading disability. Analysis and implication for correction of reading difficulties.
642. **REMEDIAL PROCEDURES IN READING (5).** LEC. 3, LAB. 4. Pr., EED 641 or consent of department head. Appropriate individual and group techniques for correcting deficiencies with practice in continuing evaluation of reading difficulties. Use of equipment and materials with children having reading problems.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
649. **THE ELEMENTARY SCHOOL PROGRAM (5).** Major curriculum areas and teaching practices in the modern elementary school. Attention given to implications of research and theory for the total elementary school program.
650. **SEMINAR IN ELEMENTARY EDUCATION. (3-10).** May be repeated for credit not to exceed 10 hours. Critical analysis and evaluation in elementary education with emphasis on improving the instructional program. An opportunity to do intensive study on selected topics.

Each of the following courses, 651, 652, 653, and 654 applies to the following areas of the elementary school program: (A) Early Childhood, (B) Elementary Education, (G) Language Arts, (H) Mathematics, (K) Science, (L) Social Science, and (R) Reading.

651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

656. **DIRECTED INDIVIDUAL STUDY IN READING DIAGNOSIS AND READING REMEDIATION (5).** Pr., EED 642 or consent of department head. Clinical experiences in diagnosing problems in reading and related areas. Also clinical experiences in the remediation of reading problems.

657. **INDIVIDUALIZING INSTRUCTION IN ELEMENTARY SCHOOLS (5).** Analysis of programs of individualizing instruction. Emphasis will be on design, implementation, and management.
695. **PRACTICUM. (1-15).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Engineering (EGR)

For other engineering courses, refer to individual departmental course offerings.

491. **LEGAL ASPECTS OF ENGINEERING, ARCHITECTURE AND DESIGN (3).** Legal aspects of engineering and design; an introduction to the American legal system with emphasis on problems of the engineering and design professions.

English (EH)

Professors Allen, Amacher, Breyer, Jones, Littleton, Nist, Woodall, and T. Wright
Associate Professors Hitchcock, Head, Brittin, Denton, Hudson, Jacobson, Jeffrey,
Latimer, Morrow, Mowat, Rose, Rygiel, and Solomon
Assistant Professors Daron,* Dunlop, R. Fenno, Gresham, Hammersmith, Kouidis,
Rivers, St. John, Stevens, Stroud, Waltman, and Williams
Instructors Alexander,* Barrett,* Brown,* Dwyer,* C. Fenno,* Hey,* Hopkins,* Jarecke,*
Keller,* Lamar,* Lewis,* Lineberger,* Lippincott,* Milnor,* Randolph,* Rankin,* Smith,*
Waters,* R. Wright*

The requirements for English and Comparative Literature majors enrolled in the School of Arts and Sciences are stated on pages 91-92; requirements for English and Comparative Literature majors enrolled in the School of Education are stated on pages 126-127.

English Composition (101-102-103 or 105-106) is required of all students and is a prerequisite for all other courses in English.

I. General Curriculum Courses

100. **BASIC ENGLISH (NO CREDIT).** All quarters. English grammar and mechanics and fundamentals of composition. Recommended for students with poor composition backgrounds or for students whose ACT or SAT verbal scores are low.
- 101-102-103. **ENGLISH COMPOSITION (3-3-3).** EH 101 pr. for 102; 102 pr. for 103. All quarters. The essentials of composition and rhetoric. Reading of selected essays, fiction, poems, and plays.
- 105-106. **HONORS FRESHMAN ENGLISH (3-3).** EH 105 pr. for 106. EH 105, Fall; 106, Winter. Reading and composition for superior students. Students earning a C or better final grade in both courses will receive an additional three hours of credit. The student who fails to earn at least a C changes to the regular sequence (EH 101-102-103) and completes a total of three courses. Departmental approval required for admission to this sequence.
141. **MEDICAL VOCABULARY (3).** Fall, Winter, Spring. Prefixes, suffixes, and the more common root words of medical terminology.
- 250-251. **SURVEY OF ENGLISH LITERATURE FOR SUPERIOR STUDENTS (5-5).** EH 250 pr. for 251. All quarters. English literature from *Beowulf* to the present. An optional alternative to EH 253-254-255 for students with a B or better average in Freshman English.
- 253-254-255. **SURVEY OF ENGLISH LITERATURE (3-3-3).** All quarters. English literature from all periods by genres: EH 253, narrative; 254, drama; 255, poetry.
- 260-261-262. **SURVEY OF LITERATURE OF THE WESTERN WORLD (3-3-3).** All quarters. Master works from Homer to Faulkner; EH 260, the Classical PERIOD; EH 261, medieval through eighteenth century; EH 262, nineteenth and twentieth centuries.

II. English Literature Before 1700

361. **HISTORY OF ENGLISH DRAMA (5).** Winter. English drama from the medieval period to 1900.
362. **POETRY AND PROSE OF THE ENGLISH RENAISSANCE (5).** Fall. Nondramatic literature, 1475-1640.

*Temporary appointment

405. **CHAUCE (5).** Winter. The major works of Chaucer in Middle English.
406. **MEDIEVAL ENGLISH LITERATURE (5).** Spring. This course concentrates on *Le Morte d'Arthur*, *Sir Gawain and the Green Knight*, *Pearl*, medieval drama, and the Middle English lyric.
465. **THE AGE OF MILTON (5).** Spring. Nondramatic literature of the seventeenth century, with emphasis on Milton.
- 498-499. **READINGS FOR HONORS (5-5).** *Pr., junior standing with a minimum of 3.0 overall average, a 3.5 average in at least five upper division English courses, and the consent of the English Department. Individual reading programs in a specific period or phase of literature or language, as determined by the instructor and student. An honors essay and a written examination will be required.
- 551-552. **SHAKESPEARE (5-5).** EH 551-552, Fall; EH 551, Winter; EH 552, Spring. The first quarter deals with the plays written before 1600, emphasizing comedies and histories; the second, with the plays written after 1600, stressing tragedies. Credit for either or both of these courses precludes credit for EH 350.

III. English Literature After 1700

352. **CONTEMPORARY FICTION (5).** Fall. American and British novelists from Lawrence to Faulkner.
363. **EIGHTEENTH-CENTURY BRITISH LITERATURE (5).** Winter. The Age of Dryden, Pope, and Swift.
375. **THE ENGLISH ROMANTIC MOVEMENT (5).** Spring. Romantic poetry from Gray to Keats.
463. **EIGHTEENTH-CENTURY ENGLISH LITERATURE (5).** Spring. Poetry and prose from Johnson through Blake.
550. **CONTEMPORARY POETRY (5).** Winter. The chief modern poets of England and America.
557. **VICTORIAN LITERATURE (5).** Winter. The major poets and nonfiction writers from 1830 to 1890.
- 581-582. **ENGLISH NOVEL (5-5).** EH 581, Fall; EH 582, Winter. The first course emphasizes the eighteenth-century novel; the second, the nineteenth-century novel.

IV. American Literature

325. **THE SHORT STORY (5).** Winter, Summer. The development of the short story in America and Europe from the early nineteenth century to the present.
- 357-358. **SURVEY OF AMERICAN LITERATURE (5-5).** All quarters. The first course deals with American literature from the beginning to 1860; the second, with American literature from 1860 to the present.
472. **THE AMERICAN NOVEL (5).** Fall. The development of the American novel from the beginning to 1900.
591. **AMERICAN POETRY (5).** Fall, alternate years. Major American poets from the Colonial period to the present.
592. **AMERICAN DRAMA (5).** Fall, alternate years. American dramatic and stage history from Colonial times to the twentieth century, with emphasis on developing tastes and techniques.
595. **SOUTHERN LITERATURE (5).** Spring. The poetry, fiction, and nonfiction prose writings in the South from Revolutionary times to the present, with major emphasis centering on Southern regional attitudes and trends. EH 365 precludes credit for this course.

V. Literature in Translation

312. **THE EUROPEAN NOVEL (5).** Spring. The reading and analysis of significant novels by major European writers.
335. **CLASSICAL MYTHOLOGY (3).** Winter. The character and influence of Greek and Roman mythology.
340. **THE CLASSICAL BACKGROUND (5).** Fall. Readings from the major Greek and Roman writers. The texts studied are chosen with particular attention to their subsequent influence upon English and American literature.
353. **CONTEMPORARY DRAMA (5).** Spring. Continental, British, and American dramatists from Ibsen to the present day.
571. **RENAISSANCE AND BAROQUE (5).** Winter. A survey of the major trends in European literature from the fourteenth to the seventeenth centuries.
573. **ROMANTICISM (5).** Spring, alternate years. A comparative study of the major authors of the Romantic movement in Europe. The course's aim will be to distinguish national peculiarities and determine possibilities of a common thematic, stylistic ground.
574. **REALISM TO NATURALISM (5).** Spring, alternate years. A comparative study of major French, German, and Russian authors of Realism and Naturalism with a view to evolving novelistic techniques, subject matter, and philosophy.
575. **THE SYMBOLIST MOVEMENT IN LITERATURE (5).** Winter. A comparative study of Symbolism of the late nineteenth and early twentieth centuries.

VI. Language and Linguistics

391. **RHETORIC AND STYLISTICS (5).** Winter. The principles of rhetorical analysis and of modern stylistics with practical application of those principles to varied types of literary materials.

*May be taken in Categories II-VII.

393. **INTRODUCTION TO THE STUDY OF THE ENGLISH LANGUAGE (5).** Fall, Spring. A brief history of English, together with a survey of traditional as well as modern approaches to the language (including both structural and transformational grammars). The focus is on the systems of English, but the course also treats semantics, usage, dialectology, lexicography, and psycholinguistics.
541. **HISTORY OF THE ENGLISH LANGUAGE (5).** Fall. The chronological development of the English language.
594. **INTRODUCTION TO LINGUISTICS (5).** Winter, Spring. Modern methods of language study, with particular emphasis on English syntax and semantics.

VII. Writing Courses

- 301-302. **CREATIVE WRITING (3-3).** EH 301 pr. for 302. Fall, Spring. The writing and criticizing of short stories.
303. **CREATIVE WRITING (3).** Winter, Summer. The writing and criticizing of poems.
304. **TECHNICAL WRITING (3).** All quarters. Practical writing, especially correspondence and reports, for students in scientific and technical fields. Credit for EH 315 precludes credit for this course.
315. **BUSINESS AND PROFESSIONAL REPORT WRITING (3).** All quarters. The writing of formal and informal business reports with emphasis on design, organization, research, and presentation.
390. **ADVANCED COMPOSITION (5).** All quarters. The practice and theory of expository writing; the command of language for the clear and forceful communication of ideas.
415. **WRITTEN BUSINESS COMMUNICATIONS (3).** All quarters. Application of semantics, communication theory, human relations, and rhetorical techniques to written business communications: practice in expository and persuasive writing.
416. **APPLIED WRITING AND EDITING (3).** Winter. An advanced course designed to develop skills in writing and editing documents common in business and industry; emphasis on preparing house organs, proposals, brochures, position papers, and annual reports.
530. **THE CRAFT OF FICTION (5).** Pr. EH 301-302, COI. Winter. The writing of fiction.

VIII. Courses on Special Topics

310. **WORD STUDY (3).** Fall. Both practical study of words to increase reading vocabulary and study of semantics (historical, literary, linguistic, general) to develop an analytical awareness of words and their uses.
350. **SHAKESPEARE'S GREATEST PLAYS (3).** Winter. Some of Shakespeare's masterpieces. Credit for EH 551-552 precludes credit for this course.
351. **SHAKESPEARE IN PERFORMANCE (3).** Spring. Some of Shakespeare's masterpieces; primary emphasis on the texts, but using also films and live actor presentations.
365. **SOUTHERN LITERATURE (3).** Spring.
373. **SCIENCE FICTION (3).** Winter, Summer. Representative science fiction from the nineteenth century to the present.
382. **POPULAR LITERATURE (3).** Spring. A study of various types of formula literature such as the detective story and the Western, and of the techniques of popular fictional writing.
383. **WOMEN IN ENGLISH AND AMERICAN LITERATURE (3).** Winter. Alternately, this course studies the stereotypes of women in literature and the achievement of women writers.
384. **THE AMERICAN DREAM (3).** Spring. The concept and sources of the American Dream and its influence on American literature from the discovery of America to the present.
385. **RECENT FICTION (3).** Alternates in fall with EH 386. The reading and discussion of selected examples of the New Fiction.
386. **CONTEMPORARY PROSE (3).** Alternates in fall with EH 385. Recent non-fiction prose works noteworthy for their style and content.
454. **SEMINAR IN LITERARY TOPICS (5).** Spring. Concentrated investigation of major figures in varying literary fields.

GRADUATE

610. **INTRODUCTION TO GRADUATE STUDY (5).** Fall.
- 611-612. **STUDIES IN THE HISTORY AND INTERPRETATION OF LITERATURE (5-5).** Summers only.
614. **THE THEORY OF PROSE FICTION (5).** Spring. Methods and techniques of prose fiction, particularly as they developed during the late nineteenth and early twentieth centuries. The course will focus on the close study of selected novels and criticism.

- 616-617. **STUDIES IN THE AMERICAN LANGUAGE (5-5).** Summers only.
620. **THE ENGLISH LANGUAGE I: OLD ENGLISH (5).** Winter.
621. **THE ENGLISH LANGUAGE II: MIDDLE AND MODERN ENGLISH TO 1500 (5).** Pr., EH 620. Winter.
623. **BEOWULF (5).** Pr., EH 620. Spring, alternate years.
625. **MEDIEVAL LITERATURE (5).** Fall.
626. **CHAUCER (5).** Spring.
627. **LINGUISTICS I: PHONOLOGY AND MORPHOLOGY (5).** Fall.
628. **LINGUISTICS II: SYNTAX AND GRAMMAR (5).** Winter, alternate years.
629. **LINGUISTICS III: FORMAL STYLISTICS (5).** Spring, alternate years.
631. **ELIZABETHAN AND JACOBAN DRAMA (5).** Fall.
632. **SPENSER (5).** Alternates in Spring with EH 636.
633. **STUDIES IN THE POETRY AND PROSE OF THE ENGLISH RENAISSANCE (5).** Alternates in Winter with EH 634.
634. **POETRY AND PROSE OF THE SEVENTEENTH CENTURY (5).** Alternates in Winter with EH 633.
635. **STUDIES IN SHAKESPEARE (5).** Spring.
636. **MILTON (5).** Alternates in Spring with EH 632.
640. **RESTORATION AND EIGHTEENTH-CENTURY ENGLISH DRAMA (5).** Spring.
641. **STUDIES IN THE AGE OF POPE (5).** Fall.
642. **STUDIES IN THE AGE OF JOHNSON (5).** Winter.
650. **STUDIES IN ENGLISH ROMANTICISM (5).** Winter.
652. **VICTORIAN POETRY (5).** Spring.
653. **VICTORIAN PROSE (5).** Fall.
654. **STUDIES IN THE NINETEENTH-CENTURY ENGLISH NOVEL (5).** Spring.
660. **MODERN POETRY (5).** Spring.
661. **MODERN FICTION (5).** Winter.
662. **STUDIES IN TWENTIETH-CENTURY LITERATURE (5).** Fall.
670. **AMERICAN LITERATURE OF THE COLONIAL AND REVOLUTIONARY PERIODS (5).** Spring.
671. **STUDIES IN AMERICAN LITERATURE, 1800-1860 (5).** Alternates in Summers and Winters with EH 673.
672. **STUDIES IN AMERICAN LITERATURE, 1860-1914 (5).** Fall.
673. **STUDIES IN THE LITERATURE OF THE SOUTH (5).** Alternates in Summers and Winters with EH 671.
680. **THE HISTORY OF LITERARY CRITICISM (5).** Alternates in Summers and Winters with EH 681.
681. **THE HISTORY OF LITERARY CRITICISM (5).** Continuation of EH 680. Alternates in Summers and Winters with EH 680.
- 684-685. **DIRECTED INDIVIDUAL STUDY (5-5).**
699. **RESEARCH AND THESIS.**
799. **RESEARCH AND DISSERTATION.**

Environmental Health (ENH)

For information on this program refer to the description of the curriculum in the Interdepartmental curricula section of the Bulletin.

Family and Child Development (FCD)

Professor M. L. Purcell, *Head*
 Associate Professors M. Layfield, B. Lindholm
 Assistant Professors Bradbard, Everett, Tyson,
 Halperin, and Hinton
 Adjunct Assistant Professor, Britt
 Instructors Coker, Davies, Edwards, Meadows
 and McLemore

157. **FAMILY AND HUMAN DEVELOPMENT (3).** All quarters. Human development as it is affected by the family and the family as it affects and is affected by the culture. Prior credit for any other Family and Child Development course precludes credit for this course.
204. **DYNAMICS OF MARRIAGE (3).** Male and female roles in mate choice, marriage, adjustment, parenthood and marriage problems. Open to men and women.
267. **CHILD DEVELOPMENT I: PRINCIPLES AND THEORIES (4).** Pr., SY 201. All quarters. Introduction to the principles and theories of child development.
269. **FAMILY I: MATE SELECTION AND MARITAL INTERACTION (4).** Pr., SY 201. Fall, Winter, Spring. Analysis of courtship mate selection, and marital interaction. Factors contributing to marital stability and success.
270. **FAMILY II: STRUCTURE AND FUNCTION OF THE FAMILY (4).** Pr., SY 201. All quarters. Introduction to the structure and function of the family, its interaction with other societal institutions, and the effects on all family members.
300. **APPROACHES TO CHILD STUDY (5).** LEC. 4, LAB. 2. Pr., FCD 267, 270. Fall, Winter, Spring. Principles and techniques of studying children and their families. Directed observation experiences are arranged in the Child Study Center.
301. **CHILD DEVELOPMENT II: INFANCY AND PRESCHOOL AGE (4).** Pr., FCD 267, 270. Fall, Winter, Spring. Physical, intellectual, and social development of children from infancy through preschool age, emphasizing familial influences on development and behavior. Lab. experiences may be arranged in the Child Study Center.
302. **CHILD DEVELOPMENT III: SCHOOL AGE AND ADOLESCENCE (4).** Pr., FCD 267, 270. Fall, Winter, Spring. Physical, intellectual, and social development of children from school age through adolescence, emphasizing familial influences on development and behavior. Laboratory experiences may be arranged.
306. **FAMILY III: PATTERNS OF FAMILY INTERACTION (4).** Pr., FCD 270. Fall, Spring. Current theories of family interaction including normal and deviant patterns and their effects.
308. **THE FAMILY AND CHILD MENTAL HEALTH (4).** Pr., FCD 267, 270. Winter, Summer. Impact of the family on children's emotional development.
310. **TECHNIQUES OF INTERVIEWING (4).** Pr., COI. or submission of initial application for internship. Fall, Spring. Principles and techniques of interviewing and establishing a helping relationship with individuals and groups.
347. **LABORATORY EXPERIENCES WITH YOUNG CHILDREN (2).** LAB. 4. Pr., FCD 267, 270, 300. Fall, Winter, Spring. Supervised participation in the Child Study Center preschool programs.
350. **INTRODUCTION TO DAY CARE FOR YOUNG CHILDREN (3).** Pr., FCD 267, 270, 300, and 301. Fall. Discussion of day care past and present. Exploration of theoretical and practical issues relating to day care programs serving children from infancy through preschool age. The variety of available child care services, policy issues and social legislation, licensing standards, and implications of day care for the family.
351. **DEVELOPMENT OF DAY CARE PROGRAMS (3).** Pr., FCD 350. Winter. Consideration of program dimensions and day care models including role of the teachers, children, families, volunteers, aids, resource personnel, and the community in developing a day care program. Inclusion of parents in supportive educational experiences. Research and evaluation in day care.
356. **LEARNING EXPERIENCES FOR YOUNG CHILDREN (4).** LEC. 4. Pr., FCD 267, 270, 300. Fall, Spring. Methods of promoting cognitive, social, emotional, and physical development of young children. To be taken before FCD 359.
359. **LEARNING EXPERIENCES FOR YOUNG CHILDREN LABORATORY (3).** LEC. 1, LAB. 6. Pr., FCD 358. Fall, Winter, Spring. Laboratory experiences in the Child Study Center implementing methods and materials taught in FCD 358.
399. **EXPERIENTIAL LEARNING (VAR).** TBA. COI. Independent work experience arranged. A. Project Uplift, B. Child Study Center.
409. **UNDERGRADUATE RESEARCH AND STUDY. CREDIT TO BE ARRANGED (1-5).** May be repeated for a maximum of 5 credits. Pr., departmental approval of written application. All quarters. Consent for enrollment is based on a written proposal outlining the proposed course of study. Students should consult the department head for further information and approval forms.
410. **DIRECTED READING IN FAMILY AND CHILD DEVELOPMENT. CREDIT TO BE ARRANGED (1-3).** Pr., COI. All quarters. May be repeated for a maximum of 3 credits.

420. **RECENT RESEARCH IN CHILD DEVELOPMENT (4).** Pr., FCD 267, 270. Winter, Summer. Synthesis of recent research in child development with particular emphasis on studies dealing with family influences on children.
467. **PARENT EDUCATION (4).** Pr., FCD 267, 270; SC 273. Fall, Winter, Summer. The principles of working with parents on both an individual and group basis. Laboratory experiences are arranged.
471. **ADMINISTRATION OF PROGRAMS FOR YOUNG CHILDREN (3).** Pr., FCD 347. Spring. Essential procedures in programming for young children, including housing, equipment, financing, staff, records, feeding, health protection, and community relations. Field trips may be arranged to selected children's centers.
477. **FAMILY AND AGING (3).** Pr., FCD 270. Spring. The interactive nature of the aging process as it relates to the family and its older members with emphasis upon the problems of health, finances, housing, and leisure time. Laboratory experiences provided.
487. **INTRODUCTION TO FIELD EXPERIENCES (2).** Pr., SW 375 and departmental approval of application for internship. Pr. or coreq. FCD 310. Fall, Winter. Introductory course designed to help students prepare for maximum utilization of supervised professional experiences.
497. **DIRECTED FIELD EXPERIENCE (5-15 HOURS IN A, B, C, D, E, OR F).** No more than three (3) options may be taken for a total of twenty (20) credits. A. Social Services; B. Family and Child Development; C. Maternal and Child Health; D. Day Care; E. Parent Education; F. Aged. Field experience arranged on individual basis, supervised by faculty in community agencies, hospitals, clinics, Child Study and Family Life Centers.
499. **SEMINAR (2).** Pr., FCD 497 or COI.

ADVANCED UNDERGRADUATE AND GRADUATE

568. **WOMEN'S CHANGING ROLES AND POTENTIALITIES (3).** A critical analysis of women's changing roles in society. Effects of these changes on the family and on women's self-fulfillment and social contributions.

GRADUATE

605. **METHODS OF RESEARCH IN HOME ECONOMICS (3).** Pr., PG 215 or equivalent. Winter, Summer. Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Family and Child Development.
609. **SPECIAL PROBLEMS (1-5).** Pr., COI and approval of written application by major professor. May be taken for more than one quarter. Not to exceed 5 hours of credit toward the minimum of 48 for the M.S. degree. All quarters. A. Family Relations; B. Child Development; C. Marriage and Family Counseling; D. Parent Education.
610. **PERSONALITY DEVELOPMENT (4).** Pr., FCD 267 or equivalent. Fall. The development of personality of the child with particular emphasis on the effects of family interaction in the early years.
611. **ADVANCED CHILD DEVELOPMENT (4).** Pr., FCD 610 or PG 533 or COI. Winter, Summer. Review, interpretation, and evaluation of substantive areas of child development emphasizing changes in knowledge of these as a result of recent research.
616. **SOCIAL DEVELOPMENT OF CHILDREN (4).** Pr., FCD 611. Summer. Theory and research related to the acquisition of social behavior by children.
618. **CHILD GUIDANCE (4).** Pr., FCD 610 or PG 533 or COI. Winter. Survey of principles and techniques of child guidance.
620. **THE FAMILY AND ITS RELATIONSHIPS (4).** Pr., SY 301, FCD 270, 610 or PG 433, or COI. Fall. Intensive study of the family and its effect on personality development.
621. **PARENT-CHILD RELATIONS (4).** Pr., FCD 270, 610 or COI. Fall. Discussion of parent-child relations and evaluation of relevant research literature.
622. **FAMILY PSYCHOPATHOLOGY (4).** Pr., FCD 620 and PG 535. Winter. Dynamics of psychopathology in families and critical evaluation of current theory and research.
623. **CHILD AND FAMILY STUDY (4).** Pr., FCD 611 or COI. Spring. Survey of principles and methods for the study of children and their families. Students develop a case study of an individual child which requires intensive appraisal of his intellectual, personality, and social development and functioning.
624. **MARRIAGE AND FAMILY COUNSELING (4).** Pr., FCD 610, 620, and 622; CED 628 or PG 638. Spring. Discussion of individual, conjoint, and group techniques of marriage and family counseling.
625. **HUMAN SEXUAL BEHAVIOR (4).** Pr., FCD 610 and 620; Pr., or coreq., FCD 622. Nature of sexual development, normal and abnormal sexual functioning; attitudes toward sex. Treatment of sexual dysfunction.
628. **PARENTAL EDUCATION (4).** Pr., SC 273, FCD 610, 611, and 620 or COI. Summer. Parent education, its scope, aims, and effects on parent-child relationships.
629. **READINGS IN FAMILY LIFE AND CHILD DEVELOPMENT (4).** Pr., FCD 267, 270 or COI. All quarters. Current literature and research concerning the pre-school child; the school-age child; the adolescent; the young adult; problems of later maturity; changing family patterns.
637. **PROFESSIONAL ISSUES IN FAMILY AND CHILD DEVELOPMENT (2).** Pr., FCD 625. Spring. History of professionalization. Role and function of professional associations and organizations, with professional licensure, ethics, and issues of private practice discussed.

660. **SEMINAR (1-5).** A. Family Relations; B. Child Development; C. Research Techniques; D. Marriage and Family Counseling; E. Parent Education.
662. **PRACTICUM (2-12).** All sections except E may be repeated for a maximum of 8 hours of credit. Section E may be repeated for a maximum of 12 hours of credit. Pr., departmental approval. All quarters. A. Child Development; B. Family Relations; C. Parent Education; D. Day Care and Programs for Young Children; E. Marriage and Family Counseling.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** All quarters. Required of all students under the Thesis Option in any field.

Fisheries and Allied Aquacultures (FAA)

Professors Shell, Head, Boyd, Lawrence, Lovell, Moss, Rogers, and Smitherman
Associate Professors Allison, Davies, Grover, Pamatmat, Plumb, Prather, Ramsey,
Schmittou, and Snow

Assistant Professors Bayne, Grizzle, and Shelton
Research Associate Johnson

312. **PRACTICAL FISH CULTURE (5). AS ARRANGED.** Credit will be arranged for 3 months in a state or federal hatchery or in an approved commercial hatchery or on other phases of fish culture. All students wishing to take this course must obtain permission to do so from the Head of the Department.
498. **SPECIAL PROBLEMS IN FISHERIES AND AQUACULTURES (1-3).** Pr., senior standing. A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

510. **ORGANIZATION, PROGRAMMING AND IMPLEMENTATION OF AQUACULTURAL EXTENSION (5). LEC. 3, LAB. 6.** Pr., AEC 202 or equivalent. Spring. Concepts and practices pertaining to aquacultural extension organization, administration, program development and implementation in the U.S. and developing countries.
515. **LIMNOLOGY (5). LEC. 3, LAB. 6.** Pr., CH 104, PS 205, BI 103. Spring. Biological, chemical, and physical factors affecting aquatic life.
516. **BIOLOGICAL PRODUCTIVITY AND WATER QUALITY (5). LEC. 5.** Pr., CH 208 or COI. Fall. Chemical and biological aspects of water quality as related to fisheries and aquaculture.
517. **ADVANCED BIOLOGICAL PRODUCTIVITY AND WATER QUALITY (5). LEC. 3, LAB. 6.** Pr., FAA 516 or COI. Winter. Advanced water quality studies related to fisheries and aquaculture. Emphasis on measurement of relevant water quality parameters and interpretation of data.
518. **FISH BREEDING (3). LEC. 3.** Pr., ZY 300. Fall. Philosophy of breeding in fishes and other aquatic animals; principles and methods in fish breeding; inheritance of characters responsible for efficient fish production.
519. **AQUACULTURE (9).** Pr., ZY 501, FAA or ZY 538. Summer. A lecture, laboratory, and field course introduces aquatic and marine biology students to the history, principles, problems, and procedures relating to the culture of commercially important crustaceans, fish, and mollusks along the Gulf coast. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
528. **HATCHERY MANAGEMENT FOR SPORT FISH (5). LEC. 3, LAB. 4.** Pr., BI 103. Spring. Operation of hatcheries for production of cold- and warm-water game fish and bait minnows; care of brood fish; methods of stocking; fertilizing, supplementary feeding, and controlling weeds; transportation of fish; control of parasites; and related hatchery problems.
529. **HATCHERY MANAGEMENT FOR FOOD FISH (5). LEC. 3, LAB. 6.** Pr., BI 103 and FAA 528. Summer. Operation of hatcheries to produce seed stock of the most important species of food finfish. Emphasis on spawning, hatching, rearing, harvesting and distribution.
530. **POND CONSTRUCTION (5). LEC. 1, LAB. 8.** Fall. Principles and practice in the selection of pond sites, surveying and mapping pond areas, and construction of dams, spillways and diversion ditches.
535. **MANAGEMENT OF AQUATIC FLORA IN FISHERIES AND AQUACULTURE (5). LEC. 3, LAB. 6.** Pr., or Coreq., BY 506 or 510 or equivalent and COI. Summer. The role of aquatic vegetation in fish production, its utilization and control.
536. **MANAGEMENT OF SMALL IMPOUNDMENTS (5). LEC. 3, LAB. 6.** Pr., BI 103. Summer. Consideration of the species of fish used in management of small impoundments, species balance, population balance analysis, methods of correcting unbalanced conditions, renovation of old impoundments, and related problems of water management.
537. **FISHERIES BIOLOGY (3).** Pr., BI 103. Winter. An introduction to the study of vital statistics of fish populations.
538. **GENERAL ICHTHYOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. Spring. Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
539. **FISHERIES BIOLOGY LABORATORY (2). LAB. 6.** Pr., FAA 537 or COI. Winter. Laboratory exercises in sampling (bias, precision, accuracy), population estimation, age and growth, mortality and population dynamics models.

544. **MORPHOLOGY OF FISH (3). LEC. 2, LAB. 3.** Pr., BI 103, COI. Summer. Gross and micro-anatomical studies of representatives of principal fish groups from the Southeastern United States.
545. **FISH PARASITOLOGY (5). LEC. 3, LAB. 6.** Pr., BI 103. Fall. Basic concepts of fish parasitology and epizootology. Identification and control of fish parasites.
546. **FISH DISEASES (5). LEC. 3, LAB. 6.** Pr., BY 300. Spring. Bacterial and viral diseases of fishes, their isolation, culture identification, and control.
547. **MANAGEMENT OF STREAMS AND LARGE IMPOUNDMENTS (3). LEC. 3.** Pr., FAA 537, or COI. Fall. Fish populations of streams and large impoundments and a consideration of methods for managing those populations.
548. **SAMPLING FISH POPULATIONS (1). LAB. 4.** Pr., or Coreq., FAA 547 or COI. Fall. Theory, equipment, and procedures for sampling fish populations.

GRADUATE

615. **ADVANCED FISHERIES BIOLOGY (5). LEC. 4, LAB. 3.** Pr., FAA 537. Spring. The concepts of population dynamics and of the interaction of reproduction, growth, and mortality in fish populations. Use of these concepts in fish population management.
618. **AQUACULTURE (5).** Pr., FAA 516. Winter. Principles underlying aquatic productivity and levels of management as demonstrated by domestic and foreign lotic and lentic cultures of fish and other aquatic crops.
620. **FISH PROCESSING TECHNOLOGY (5). LEC. 3, LAB. 6.** Pr., CH 208 and BY 300 or ADS 514. Winter. Chemical and biological aspects of fishery products as they are related to the use of these products for human foods; principles of preservation; unit operations in processing; packaging, storage, and distribution.
621. **FISH NUTRITION (5). LEC. 3, LAB. 6.** Pr., CH 208 and course in physiology or nutrition or COI. Summer. Fundamental and applied aspects of fish nutrition including the physiology of food assimilation, nutrient requirements, nutrient chemistry of feed sources, ration formulation and practical feeding.
624. **WATER QUALITY MANAGEMENT IN AQUACULTURE (5). LEC. 5.** Pr., FAA 516, 617, or COI. Spring. Chemical, mechanical, and biological methods for maintaining and improving water quality in fish culture.
625. **WATER UTILIZATION IN AQUACULTURE (5). LEC. 5.** Pr., FAA 516. Winter. Climatic, geologic, hydrologic, economic and hydraulic factors influencing the utilization of water for aquaculture.
645. **ADVANCED FISH PARASITOLOGY (3). LEC. 1, LAB. 6.** Pr., FAA 545. Winter. The morphology, taxonomy, life history, ecology and pathological effects of parasites of fish.
546. **ADVANCED MICROBIAL FISH DISEASES (3). LEC. 1, LAB. 6.** Pr., FAA 546 or COI. Fall. Advanced study of the epizootology, pathogenesis, isolation, taxonomy and immunology of bacterial and viral diseases of fish.
547. **CLINICAL FISH DISEASE DIAGNOSIS (1-3).** Pr., 544, 545, 546 or COI. Any quarter by arrangement. Clinical diagnosis of fish diseases; necropsy of diseased fish and formulating corrective measures for diseased condition. May be repeated for a maximum of 6 hours credit.
649. **FISH PATHOLOGY (3). LEC. 2, LAB. 3.** Pr., FAA 544, 546. Spring. Structural and functional changes produced by fish diseases.
693. **SEMINAR. (CREDIT TO BE ARRANGED.)**
698. **SPECIAL PROBLEMS IN FISHERIES AND ALLIED AQUACULTURES (2-5).** A. Aquaculture; B. Aquatic Ecology; C. Biology and Management; D. Ichthyology; E. Nutrition; F. Pathology; G. Processing and Technology; H. Water Quality.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Food Science (FS)

Professors Cannon, *Chairman*, Huffman, and Lovell
Associate Professors M. F. Chastain, McCaskey, and Rymal
Assistant Professors D. A. Smith and Flood

The Food Science curriculum is administered by an inter-departmental committee.

101. **MAN'S FOOD (3). LEC. 3.** Fall, Winter, Spring. Analysis of the world food supply; problems of food availability and distribution; methods of alleviating food shortages; role of the food processor. (Same course as ADS 101.)
201. **INTRODUCTORY FOOD SCIENCE AND TECHNOLOGY (5).** Fall. The nature of the principal food industries; applications of chemistry and microbiology in food processing technology. (Same course as ADS 201.)
210. **INTRODUCTORY MEAT SCIENCE AND TECHNOLOGY (4). LEC. 2, LAB. 4.** Fall, Winter. Theory and practice of slaughtering and cutting; identification and uses of meats. (Same course as ADS 210.)
305. **MEAT SELECTION AND GRADING (2). LEC. 1, LAB. 2.** Pr., ADS 210. (Same course as ADS 305.)

309. **LIVE ANIMAL AND CARCASS EVALUATION (3).** LEC. 1, LAB. 4. Pr., ADS 200, 210, Winter, Spring. Classifying and grading market hogs, cattle and sheep with major emphasis on indicators of carcass merit. Carcass grading, yield grading and evaluation. (Same course as ADS 309.)
312. **DAIRY FOOD PROCESSING (3).** LEC. 2, LAB. 2. Fall. Product standards and identity. Basic operations in the processing of dairy foods. Methods of quality assurance. (Same course as ADS 312.)
340. **INDUSTRIAL FOOD PRESERVATION TECHNOLOGY (5).** LEC. 3, LAB. 4. Pr., COI or junior standing. Fall, odd years. Principles of food preservation as applied to industry. Processes considered including refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives. (Same course as HF 340.)
355. **FOOD ENGINEERING (5).** Fall. (Same course as AN 355.) Engineering concepts and unit operations used in processing and handling of food products.
429. **FOOD SCIENCE SEMINAR (1).** Pr., senior standing. Winter. Lectures, discussions and literature reviews by staff, students, and guest lectures. (Same course as HF 429.)
510. **MEAT TECHNOLOGY (4).** LEC. 2, LAB. 4. Pr., ADS 210. Spring. Meat curing and processing procedures and the biochemical alterations of meat during aging, curing and processing. (Same course as ADS 510.)
512. **FROZEN AND CONCENTRATED DAIRY FOODS (3).** LEC. 2, LAB. 2. Pr., ADS 312. Winter. Specialized techniques in the processing and handling of frozen and concentrated dairy foods. (Same course as ADS 512.)
513. **FERMENTED DAIRY FOODS (3).** LEC. 2, LAB. 2. Pr., ADS 312. Spring. Bacterial culture handling, processing and curing of cheese varieties, processing and handling cultured milk products. (Same course as ADS 513.)
514. **FOOD MICROBIOLOGY (5).** LEC. 3, LAB. 4. Pr., BY 300. Spring. The relationship of habitat to the occurrence of microorganisms on food, environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs, and public health and sanitation bacteriology. (Same as ADS 514.)
515. **FOOD PLANT SANITATION (3).** LEC. 2, LAB. 2. Winter. Sanitary regulations of food plants. Principles and procedures of cleaning and sanitizing food handling equipment. (Same course as ADS 515.)
516. **ADVANCED MEAT SCIENCE AND MUSCLE BIOLOGY (4).** LEC. 3 LAB. 3. Pr., ADS 210 or equivalent. Spring. Advanced studies of composition of meat; muscle microanatomy, biochemical and physiological aspects of muscle contraction; muscle physiology and meat quality. (Same course as ADS 516.)
543. **FOOD CHEMISTRY (5).** LEC. 3, LAB. 4. Pr., CH 207. Winter. The chemistry of the important components of foods and changes occurring during processing, storage and handling. (Same course as HF 543.)
545. **FOOD ANALYSIS AND QUALITY CONTROL (5).** LEC. 3, LAB. 4. Pr., HF 543. Spring. Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards. (Same course as HF 545.)

Foreign Languages (FL)

Professors DiOrio, Head, and Peak

Associate Professors Helmke, Madrigal, Phillips, Posniak, and Warbington

Assistant Professors Kouidis, Latimer, Mason, Morris, Perricone, Rivas,

Spencer, and Wolverton

Instructors Cox, Elmore, Millman, Thomas, and Vandegrift

It is to the student's advantage to begin foreign language at the highest possible level because by so doing he can gain college credits through advanced placement. On the basis of the Foreign Language Department's evaluation of his previous foreign language training and/or test scores, he may enter the second, third, or fourth quarter course in a language. If he makes a grade of C or higher, he will receive 10, 15, or 20 hours, respectively (5 credit hours for the course and 5, 10, or 15 hours, respectively, for advanced placement). If the student is well enough prepared, he may enter at a level higher than the fourth quarter, but he will not receive more than 15 hours through advanced placement.

If he does not earn at least a C, he will not be granted advanced placement credit. He may then enter the language at a lower level, re-enter at the same level, or attempt another approved language.

Credits earned through advanced placement may be applied toward graduation as well as toward foreign language requirements in various curricula.

While eligible for advanced placement as indicated above, students who are native speakers in a foreign language may begin courses in that language only at the 300-level or higher—excluding conversation courses altogether—if they have received substan-

tial academic preparation in that same language (such as the French "Baccalauréat," the German "Abitur," the Spanish "Bachillerado," or higher).

Students who are either foreign or U.S. ethnic native speakers in a foreign language, but with minimal or limited academic preparation therein, may begin courses in that language only at the 200-level or higher. If special situations arise, such as foreign language learning through extensive residence abroad, the adviser for the specific language involved will make an appropriate entry level determination, within the framework of these guidelines, upon request of the instructor in whose class the student is enrolled.

Language Proficiency Courses

- 080. PROFICIENCY IN ENGLISH FOR FOREIGN STUDENTS. NO CREDIT.** Individualized and small group instruction primarily for foreign graduate students who need to obtain greater proficiency in comprehension and in spoken and written English, including idiomatic expressions and cultural adaptation. May be repeated.
- 127-128. READING PROFICIENCY IN FRENCH. NO CREDIT. LEC. 3.** Pr. for FL 128, departmental consent, Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 128 channels students into their field of study, e.g., humanities, social sciences, and sciences.
- 137-138. READING PROFICIENCY IN SPANISH. NO CREDIT. LEC. 3.** Pr. for FL 138, departmental consent, Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 138 channels students into their field of study, e.g., humanities, social sciences, and sciences.
- 157-158. READING PROFICIENCY IN GERMAN. NO CREDIT. LEC. 3.** Pr. for FL 158, departmental consent, Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 158 channels students into their fields of study, e.g., humanities, social sciences, and sciences.
- 177-178. READING PROFICIENCY IN RUSSIAN. NO CREDIT. LEC. 3.** Pr. for FL 178, departmental consent, Winter and Spring. Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 178 channels students into their field of study, e.g., humanities, social sciences, and sciences.
- 391. LYRIC DICTION PROFICIENCY IN FRENCH, GERMAN, ITALIAN. (3).** Winter. Stress on phonetics and prosody. Primarily for undergraduate students in music seeking technical control of lyric diction and prosody in French, German, and Italian. May be used for foreign language students for elective credit only. This course does not substitute for the three quarters of foreign language required for the Bachelor of Music degree. May be repeated without credit.

Latin

- 111-112-113. FIRST YEAR LATIN I-II-III (5-5-5).** FL 111 pr. for 112; FL 112 pr. for FL 113. Fundamentals of Latin; language skills stressed with increasing emphasis on reading, including selections from ancient authors.
- 211-212-213. SECOND YEAR LATIN I-II-III (5-5-5).** Pr., FL 113 or equivalent. FL 211 pr. for 212; FL 212 pr. for 213. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Review of Latin grammar and syntax and survey of Latin literature through selected readings of authors primarily from the Golden and Silver Ages, 80 B.C.—ca. 140 A.D.

French

- 121-122-123. FIRST YEAR FRENCH I-II-III (5-5-5).** FL 121 pr. for 122; FL 122 pr. for 123. Fundamentals of French; language skills stressed with progressive emphasis on conversation. Exposure to French civilization.
- 220. READINGS IN FRENCH NEWSPAPERS AND MAGAZINES (3).** Pr., FL 123 or equivalent. Practice in reading comprehension in French to maintain and upgrade proficiency. Texts chosen from selected French publications with emphasis on contemporary culture (French life, politics, customs, social institutions, etc.). Grammar is covered as an aid to reading, and discussions of texts are conducted in English. May not be counted toward a major or minor.
- 221-222-223. SECOND YEAR FRENCH I-II-III (5-5-5).** Pr., FL 123 or equivalent. FL 221 pr. for 222; FL 222 pr. for 223. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Language skills stressed: structural review and composition; reading in French literature; exposure to French civilization.
- 321. FRENCH CONVERSATION (3 OR 5*).** Pr., FL 223 or equivalent. Fall. Practice in spoken, everyday French, based on texts and situations concerning contemporary life especially in France. May be repeated once for credit but counted only once toward a major.
- 322. FRENCH COMPOSITION (3 OR 5*).** Pr., FL 223 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports, based on original composition and on translation. May be repeated once for credit but counted only once toward a major.

*300 and 500 level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

323. **FRENCH CIVILIZATION (3 OR 5').** Pr., FL 223 or equivalent. Spring. A presentation of the cultural heritage of France including present day institutions.
324. **SURVEY OF FRENCH LITERATURE I (3 OR 5').** Pr., FL 223 or equivalent. Fall. Readings in French literature from the Middle Ages through the seventeenth century.
325. **SURVEY OF FRENCH LITERATURE II (3 OR 5').** Pr., FL 223 or equivalent. Winter. Readings in French literature from the eighteenth and the early nineteenth centuries.
326. **SURVEY OF FRENCH LITERATURE III (3 OR 5').** Pr., FL 223 or equivalent. Spring. Readings in French literature from the latter nineteenth and the twentieth centuries.
327. **SEMINAR IN FRENCH LITERATURE AND/OR LANGUAGE SKILLS (3 OR 5').** Pr., FL 223 or equivalent. Summer. Readings in French literature from selected periods and/or practice in writing and speaking French. May be repeated once for credit but counted only once toward a major.
329. **BUSINESS FRENCH (3).** Pr., FL 223 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in French. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
427. **INDEPENDENT WORK IN FRENCH (3 or 5').** Pr., four 300-level French courses or equivalent. Directed study in area of special interest, for the superior student in French. May be repeated once for credit.
428. **FRENCH CONTINUING CONVERSATION (1).** Pr., FL 321 and FL 322, or equivalent. Continuing practice in spoken French to maintain and upgrade proficiency while completing other requirements for graduation. May not be counted toward a major, but may be repeated once for credit.
429. **FRENCH CONTINUING COMPOSITION (1).** Pr., FL 321 and FL 322, or equivalent. Continuing practice in written French to maintain and upgrade proficiency while completing other requirements for graduation. May not be counted toward a major, but may be repeated once for credit.

Spanish

- 131-132-133. **FIRST YEAR SPANISH I-II-III (5-5-5).** FL 131 pr. to 132; FL 132 pr. to 133. Fundamentals of Spanish. Language skills stressed with progressive emphasis on conversation. Exposure to Hispanic civilization.
- 231-232-233. **SECOND YEAR SPANISH I-II-III (5-5-5).** Pr., FL 133 or equivalent. FL 231 pr. to 232; FL 232 pr. to 233. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Language skills stressed; structural review and composition; reading in Spanish literature; exposure to Hispanic civilization.
331. **SPANISH CONVERSATION (3 OR 5').** Pr., FL 233 or equivalent. Fall. Intensive practice in the spoken language, with simultaneous review of vocabulary and structure. May be repeated once for credit but counted only once toward a major.
332. **SPANISH COMPOSITION (3 OR 5').** Pr., FL 233 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports, based on original composition and translation. May be repeated once for credit but counted only once toward a major.
333. **SPANISH CIVILIZATION (3 or 5').** Pr., FL 233 or equivalent. Alternate Spring. Intensive exposure to the culture of Spain, as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish civilization and its contribution to world cultures.
334. **SURVEY OF SPANISH LITERATURE TO 1700 (3 OR 5').** Pr., FL 233 or equivalent. Fall. Development of Spanish literature from its beginnings through the Golden Age (1700).
335. **SURVEY OF SPANISH LITERATURE FROM 1700 (3 OR 5').** Pr., FL 233 or equivalent. Winter. Development of Spanish literature from the Decadencia (1700) to the contemporary period.
336. **SURVEY OF SPANISH AMERICAN LITERATURE (3 OR 5').** Pr., FL 233 or equivalent. Spring. Panorama of literature in Spanish America from pre-Columbian times to present.
337. **SEMINAR IN ADVANCED COMPOSITION AND CONVERSATION (3 or 5').** Pr., FL 233 or equivalent. Summer. Intensive practice in composition and conversation through original and directed themes as well as through oral presentations. May be repeated once for credit but counted only once toward a major.
338. **SPANISH-AMERICAN CIVILIZATION (3 or 5').** Pr., FL 233 or equivalent. Alternate Spring. Intensive exposure to the culture of Spanish America, as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Spanish-American civilization and its contribution to world cultures.
339. **BUSINESS SPANISH (3).** Pr., FL 233 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in Spanish. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
437. **SEMINAR IN HISPANIC LITERATURE (3 or 5').** Pr., four 300-level Spanish courses or equivalent. Readings in Hispanic literature from selected genres, authors, periods or movements. May be repeated once for credit.
438. **SPANISH CONTINUING CONVERSATION (1).** Pr., FL 331 and FL 332, or equivalent. Continuing practice in spoken Spanish to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.

*300 and 500-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

439. **SPANISH CONTINUING COMPOSITION (1).** Pr., FL 331 and FL 332, or equivalent. Continuing practice in written Spanish to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.

Italian

- 141-142-143. **FIRST YEAR ITALIAN I-II-III (5-5-5).** FL 141 pr. to 142; 142 pr. to 143. Fundamentals of Italian. Language skills stressed, with progressive emphasis on conversation. Exposure to Italian civilization.
- 241-242-243. **SECOND YEAR ITALIAN I-II-III (5-5-5).** Pr., FL 143 or equivalent. FL 241 pr. to FL 242; FL 242 pr. to FL 243. (Exceptions to this sequence may be granted by departmental consent or when course offerings so require.) Stress on language skills; structural review and composition; readings in Italian literature and exposure to Italian civilization.

German

- 151-152-153. **FIRST YEAR GERMAN I-II-III (5-5-5).** FL 151 pr. to 152; 152 pr. to 153. Fundamentals of German. Stress on language skills, with progressive emphasis on conversation. Exposure to Germanic civilization.
- 251-252-253. **SECOND YEAR GERMAN I-II-III (5-5-5).** Pr., FL 153 or equivalent. FL 251 pr. to 252; 252 pr. to 253. Exceptions to the sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition; readings in German literature and exposure to German civilization.
351. **GERMAN CONVERSATION (3).** Pr., FL 251 or equivalent. Fall. Practice in spoken, everyday German, based on texts and situations concerning contemporary life in Germany or other German-speaking countries.
352. **GERMAN COMPOSITION (3).** Pr., FL 251 or equivalent. Winter. Practice in writing letters, brief articles, themes and reports based on original composition and on translation.
353. **GERMAN CIVILIZATION (3).** Pr., FL 251 or equivalent. Spring. Review of the cultural heritage of the German language, with emphasis on its present-day status, influence and civilization in Germany and abroad.
354. **SURVEY OF GERMAN LITERATURE I (3).** Pr., FL 253 or any two German courses on the 300-level. Fall. Readings in German literature of the earliest periods to the eighteenth century.
355. **SURVEY OF GERMAN LITERATURE II (3).** Pr., FL 253 or any two German courses on the 300-level. Winter. Readings in German literature of the nineteenth century.
356. **SURVEY OF GERMAN LITERATURE III (3).** Pr., FL 253 or any two German courses on the 300-level. Spring. Readings in German literature of the twentieth century.
357. **SEMINAR IN GERMAN LITERATURE (3).** Pr., FL 251 or equivalent. Summer. Readings in German literature from selected periods. Normally offered in Summer Quarter only.
359. **BUSINESS GERMAN (3).** Pr., FL 253 or equivalent. Intensive practice in preparing commercial correspondence and reading contracts, agreements, and related documents in German. Emphasis will be placed on the acquisition of a business-oriented vocabulary.
451. **GERMAN CLASSICISM (3).** Pr., four 300-level German courses or equivalent. Alternate Fall. Consideration, analysis, and criticism of German writing of the classical period.
452. **GERMAN ROMANTICISM (3).** Pr., four 300-level German courses or equivalent. Alternate Winter. Consideration, analysis, and criticism of German Romantic writing.
453. **GERMAN REALISM AND NATURALISM (3).** Pr., four 300-level German courses or equivalent. Alternate Spring. Consideration, analysis, and criticism of German writing of Realism and Naturalism.
454. **GERMAN DRAMA (3).** Pr., four 300-level German courses or equivalent. Alternate Fall. Consideration, analysis, and criticism of selected German theater.
455. **TWENTIETH-CENTURY GERMAN LITERATURE (3).** Pr., four 300-level German courses or equivalent. Consideration, analysis, and criticism of selected German prose prior to World War II.
456. **CONTEMPORARY GERMAN LITERATURE (3).** Pr., four 300-level German courses or equivalent. Consideration, analysis, and criticism of selected German writing since World War II.
457. **INDEPENDENT WORK IN GERMAN (3).** Pr., at least one 400-level German course and COI. Directed study in area of special interest for the superior student in German. May be repeated once for credit.
458. **GERMAN CONTINUING CONVERSATION (1).** Pr., four 300-level German courses, including FL 351 and FL 352, or equivalent. Continuing practice in spoken German to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.
459. **GERMAN CONTINUING COMPOSITION (1).** Pr., four 300-level German courses, including FL 351 and FL 352, or equivalent. Continuing practice in written German to maintain and upgrade proficiency while completing other requirements for graduation. May be repeated once for credit, but counted only once toward a major.

¹300 and 500-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

Portuguese

- 161-162-163. FIRST YEAR PORTUGUESE I-II-III (5-5-5).** FL 161 pr. to 162; 162 pr. to 163. Fundamentals of Portuguese. Stress on language skills; progressive emphasis on conversation. Exposure to Luso-Brazilian civilization.
- 261-262-263. SECOND YEAR PORTUGUESE I-II-III (5-5-5).** Pr. FL 163 or equivalent. FL 261 pr. to 262; 262 pr. to 263. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition; readings in Luso-Brazilian literature. Exposure to Luso-Brazilian civilization.

Russian

- 171-172-173. FIRST YEAR RUSSIAN I-II-III (5-5-5).** FL 171 pr. to 172; FL 172 pr. to 173. Fundamentals of Russian. Stress on language skills; progressive emphasis on conversation. Exposure to Russian civilization.
- 271-272-273. SECOND YEAR RUSSIAN I-II-III (5-5-5).** Pr. FL 173 or equivalent. FL 271 pr. to 272; FL 272 pr. to 273. Exceptions to this sequence may be granted by departmental consent or when course offerings so require. Stress on language skills; structural review and composition. Readings in Russian literature; continued exposure to Russian civilization.
- 371. RUSSIAN LITERATURE FROM 1820-1860 IN TRANSLATION (3).** Literary history of the period; selected works by Pushkin, Lermontov, Gogol, Goncharov, Turgenev.
- 372. RUSSIAN LITERATURE FROM 1860-1917 IN TRANSLATION (3).** Dostoevsky, Tolstoy, Chekhov.
- 373. SOVIET RUSSIAN LITERATURE 1917 TO PRESENT IN TRANSLATION (3).** Gorky, Sholokhov, Mayakovsky, Pasternak, Solzhenitsyn and others.

FRENCH ADVANCED UNDERGRADUATE AND GRADUATE COURSES

- 521. ADVANCED FRENCH CONVERSATION AND PHONETICS (3 or 5*).** Pr., four 300-level French courses or equivalent. Training in oral French to increase vocabulary, improve fluency and pronunciation. May be repeated once for credit.
- 522. ADVANCED FRENCH COMPOSITION AND STYLISTICS (3 or 5*).** Pr., four 300-level courses or equivalent. Exercises in advanced grammar and syntax designed to enhance the student's linguistic ability. Practice in composition, *explication de texte*, and in the use of stylistic devices derived from significant literary sources. May be repeated once for credit.
- 523. ADVANCED FRENCH CIVILIZATION (3 or 5*).** Pr., four 300-level French courses or equivalent. An in-depth study of French civilization, with emphasis on the relationship of history, arts, and literature from the Middle Ages to the present.
- 524. FRENCH LITERATURE SINCE WORLD WAR II (3).** Pr., four 300-level French courses or equivalent. Consideration, analysis, and criticism of selected authors and movements in letters, theater, cinema, and other media.
- 525. FRENCH LITERATURE OUTSIDE CONTINENTAL FRANCE (3).** Pr., four 300-level French courses or equivalent. Consideration, analysis, and criticism of selected French literature from Africa, the Antilles, Canada, and other French-speaking areas.
- 526. SEMINAR IN ADVANCED LANGUAGE SKILLS (3).** Pr., four 300-level French courses or equivalent. Practice in writing and speaking French. Exercises include compositions and expositions. May be repeated once for credit.
- 527. SEMINAR IN FRENCH LITERARY GENRES AND MOVEMENTS (3 or 5*).** Pr., four 300-level French courses or equivalent. Intensive readings in French literature from selected genres or movements.
- 528. RESEARCH METHODS (1).** Pr., four 300-level French courses or equivalent. An introduction to the methods of scholarly investigation in literary history and criticism. Special emphasis is given to practical training in the use of bibliographical resources and in the preparation of formal written presentations of research results.

SPANISH ADVANCED UNDERGRADUATE AND GRADUATE COURSES

- 530. MIDDLE AMERICAN SHORT STORY (3).** Pr., four 300-level Spanish courses or equivalent. The short story in Middle America, with emphasis on the modern and contemporary periods.
- 531. SOUTH AMERICAN SHORT STORY (3).** Pr., four 300-level Spanish courses or equivalent. The short story in South America, with emphasis on the modern and contemporary periods.
- 532. MIDDLE AMERICAN THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The theater in Middle America, with emphasis on the contemporary period.
- 533. SOUTH AMERICAN THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The theater in South America, with emphasis on the contemporary period.

*500 and 600-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

534. **CERVANTES (3).** Pr., four 300-level Spanish courses or equivalent. The prose works of Cervantes with special emphasis on *Don Quixote*.
535. **CONTEMPORARY SPANISH POETRY (3).** Pr., four 300-level Spanish courses or equivalent. Spanish poetry since 1900.
536. **CONTEMPORARY SPANISH THEATER (3).** Pr., four 300-level Spanish courses or equivalent. The Spanish theater since 1900.
537. **CONTEMPORARY SPANISH PROSE FICTION (3).** Pr., four 300-level Spanish courses or equivalent. The development of prose fiction from the eighteenth century to modern times.
538. **CONTEMPORARY SPANISH-AMERICAN POETRY (3).** Pr., four 300-level Spanish courses or equivalent. Poetic forms, leading movements, and principal poets in Spanish America since Modernism.
539. **SEMINAR IN COMPOSITION AND STYLISTICS (3 or 5*).** Pr., four 300-level Spanish courses or equivalent. Advanced training in composition and stylistics with specific course materials determined by needs of students. May be repeated once for credit.
540. **SEMINAR IN CONVERSATION AND PHONETICS (3 or 5*).** Pr., four 300-level Spanish courses or equivalent. Advanced training in conversation and phonetics with specific course materials determined by needs of students. May be repeated once for credit.

GRADUATE COURSES IN FRENCH AND SPANISH

A non-sequential offering of courses required of students pursuing the degrees of Master of Arts in French, Master of Arts in Spanish, Master of French Studies, Master of Hispanic Studies, and Master of Arts in College Teaching. Representative works, literary movements, and techniques of literary criticism within respective genres of French, Spanish American, and Spanish literature are emphasized and analyzed in depth. A background in the history of the French language and of the Spanish language is presented and required of all Master's candidates. Courses may be taken concurrently.

FRENCH GRADUATE COURSES

620. **HISTORY OF THE FRENCH LANGUAGE (3).** The history of the language from its Latin origins to the present day. Phonological, morphological, syntactic, and lexical developments are traced. External factors affecting these developments are considered as well.
621. **MEDIEVAL FRENCH LITERATURE (3).** An introduction to medieval French literature and the language in which it was composed. Representative samples of texts from different genres are read and examined mainly from a literary viewpoint.
622. **SIXTEENTH-CENTURY FRENCH LITERATURE I (3).** The development of French prose during the sixteenth century. Prevailing elements of Renaissance thought are considered through the works of representative authors.
623. **SIXTEENTH-CENTURY FRENCH LITERATURE II (3).** The development of French poetry and drama during the sixteenth century. Major elements of the Renaissance are considered through the works of representative authors.
624. **SEVENTEENTH-CENTURY FRENCH LITERATURE I (3).** The development of French poetry and prose during the seventeenth century. Major movements such as *apricosité* and Neoclassicism are treated through the works of representative authors.
625. **SEVENTEENTH-CENTURY FRENCH LITERATURE II (3).** The development of French drama during the seventeenth century. Works by Corneille, Molière and Racine are emphasized.
626. **EIGHTEENTH-CENTURY FRENCH LITERATURE I (3).** The development of French literature during the eighteenth century, with emphasis on drama, *contes philosophiques* and major works of the philosophers of the Enlightenment.
627. **EIGHTEENTH-CENTURY FRENCH LITERATURE II (3).** The development of the French novel during the eighteenth century. Major trends and themes (*roman picaresque*, *roman épistolaire*, *sensibilité pré-romantique*) are treated through the works of representative authors.
628. **NINETEENTH-CENTURY FRENCH LITERATURE I (3).** The development of French poetry and drama during the nineteenth century. Major movements such as Romanticism, Parnassianism and Symbolism are treated through the works of representative authors.
629. **NINETEENTH-CENTURY FRENCH LITERATURE II (3).** The development of French prose, particularly the novel, during the nineteenth century. Major movements such as Romanticism, Realism and Naturalism are treated through the works of representative authors.

*500 and 600-level French and Spanish courses will carry five quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

660. **TWENTIETH-CENTURY FRENCH LITERATURE I (3).** The development of French literature before World War I. An in-depth study and analysis of major authors and movements in all genres.
661. **TWENTIETH-CENTURY FRENCH LITERATURE II (3).** The development of French literature between World War I and World War II. Major literary trends and movements in all genres are treated through the works of representative authors.
662. **DIRECTED READINGS IN FRENCH LITERATURE (1-3). (CREDIT TO BE ARRANGED).** Supervised study in specialized areas. Registration is by permission of the department and the instructor. May be repeated for credit.
663. **INTRODUCTION TO COLLEGE-LEVEL FRENCH INSTRUCTION (1).** Instruction for graduate teaching assistants including critical observation of performance and guidance by a designated supervisory professor. May be repeated for a maximum of two credits.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).**

SPANISH GRADUATE COURSES

630. **HISTORY OF THE SPANISH LANGUAGE (3).** The history of the language from its Latin origins to the present day. Phonological, morphological, syntactic and lexical developments are traced. External factors affecting these developments are considered as well.
631. **MEDIEVAL SPANISH LITERATURE (3).** An introduction to medieval Spanish literature and the language in which it was composed. Representative samples of texts from the different genres are read and examined mainly from a literary viewpoint.
632. **EARLY DEVELOPMENT OF THE SPANISH THEATER (3).** A critical and historical study of the development of the theater from the *Auto de Los Reyes Magos* through Lope de Vega.
633. **GOLDEN AGE SPANISH THEATER (3).** A critical and historical study of the theater of the seventeenth century after Lope de Vega.
634. **EIGHTEENTH AND NINETEENTH-CENTURY SPANISH THEATER (3).** An intensive study of the Spanish theater from 1700 to 1900.
635. **RENAISSANCE—GOLDEN AGE SPANISH PROSE FICTION (3).** A critical and historical study of the prose fiction of the Renaissance and Golden Age through representative authors.
636. **RENAISSANCE—GOLDEN AGE SPANISH POETRY (3).** Spanish poetry from the Renaissance to 1700.
637. **EIGHTEENTH AND NINETEENTH-CENTURY SPANISH POETRY (3).** Spanish poetry from 1700 to 1900.
638. **MIDDLE AMERICAN NOVEL (3).** The modern and contemporary novel in Middle America.
639. **SOUTH AMERICAN NOVEL (3).** The modern and contemporary novel in South America, excluding the River Plate region.
640. **RIVER PLATE REGION NOVEL (3).** The modern and contemporary novel of the River Plate region in South America.
641. **DEVELOPMENT OF SPANISH-AMERICAN POETRY THROUGH MODERNISM (3).** The development of poetic forms, of leading movements and principal poets in Spanish America from the pre-Columbian epoch through Modernism.
642. **SEMINAR IN HISPANIC LITERATURE (3 or 5*).** Intensive readings in Hispanic literature from selected genres, authors, periods or movements. May be repeated once for credit.
643. **DIRECTED RESEARCH (1).** Study and research in specialized areas under the direct supervision of one faculty member. Registration by permission only. May be repeated twice for credit.
644. **INTRODUCTION TO COLLEGE-LEVEL SPANISH INSTRUCTION (1).** Instruction for graduate teaching assistants including critical observation of performance and guidance by a designated supervisory professor. May be repeated for a maximum of two credits.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).**

*500 and 600-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

Forestry (FY)*

Professors Thompson, Head, Biblis, Goggans, Johnson, Tang
 Associate Professors Beals, Flick, Lanford, Larsen, Lyle
 Assistant Professors Brewer, Davis, DeBrunner, Gjerstad, Golden
 Instructor Jones

206. **WOOD MEASUREMENTS (3).** LEC. 2, LAB. 3. Pr., MH 160 or equivalent. Spring. Wood measurements oriented toward the needs of students in wood technology.
210. **WOOD AND ART (1).** LAB. 2. The students will be introduced to wood terminology and to the use of wood in art forms in comparison with metal and stone. The unique properties of selected species will be studied.
300. **INTRODUCTION TO FORESTRY (2).** LEC. 2. Summer. An orientation course for persons entering the forest management curriculum. Basic forestry concepts of multiple use and sustained yield. Problems of timber, water, wildlife, range, and recreational management, and major careers for professional foresters.
301. **DENDROLOGY (3).** LAB 9. Pr., BI 102. Summer. Taxonomy and identification of important forest plants of the United States.
302. **FOREST BIOLOGY (2).** LAB. 6. Pr., BI 102. Summer. Field exposure to important principles of forest biology and some examples of their practical applications to forest resource management.
304. **FOREST SURVEYING (4).** LAB. 12. Pr., MH 162. Summer. Basic concepts and procedures of surveying as applied to forestry.
305. **FIELD MENSURATION (3).** LAB. 9. Pr., MH 162. Summer. Basic concepts and procedure for measuring trees and stands: units of measure used in forestry; application of log rules and volume tables; condition class mapping; elementary timber estimating.
306. **FOREST CARTOGRAPHY (1).** LAB. 3. Pr., MH 162. Summer. Basic concepts and procedures of drafting planimetric and topographic maps.
311. **WOOD ANATOMY (5).** LEC. 3, LAB. 6. Pr., FY 205. Fall. Identification of commercial woods of industry by microscopic features. Comparative anatomy and phylogenetic relationships. Introduction to microtechnique and maceration techniques.
313. **SAMPLING I (4).** LEC. 3, LAB 3. Pr., FY 304, 305, 306, MH 163. Fall. Basic concepts and procedures of statistical sampling as applied to forest resource assessment and management.
314. **SAMPLING II (4).** LEC. 3, LAB. 3. Pr., FY 313, IE 204. Winter. Continuation of Sampling I.
320. **FOREST TREE PHYSIOLOGY (3).** LEC. 3. Pr., CH 104, FY 301, 302, PS 200, or COI. Fall. Relationship between environmental and genetic factors. Metabolism and growth of individual trees.
330. **FOREST PRODUCTS (5).** LEC. 3, LAB. 6. Pr., FY 205 or 311. Fall. Specifications, grading and manufacture of wood products derived from forest lands, including an introduction to pulp and paper manufacture and other chemical and mechanical processes utilizing wood.
350. **FARM FORESTRY (5).** LEC. 5. Pr., sophomore standing. Fall, Winter. (Not open to students in the Forestry degree curricula.) The place of farm forests in agricultural economy. The application of forestry principles to the problems of the farm woodland, especially as they relate to Alabama conditions.
370. **WOOD AS AN ART MEDIUM (3).** LEC. 1, LAB. 4. For students majoring in the Fine Arts. Winter. Basic technology and properties of wood as applied to its use as an art medium. Wood identification, design of wood forms, and effect of moisture on the dimensional stability of wood. Design problems involving wood.
400. **FORESTRY TOUR (1-3).** LAB. (1-3). Tours up to 2 weeks long to points of outstanding interest to foresters. May be taken more than once if different tours are involved.
403. **FOREST RECREATION (3).** LEC. 1, LAB. 6. Summer. Planning and administration of recreation in forest land management. Extended field trips will be made.
415. **FOREST MENSURATION (5).** LEC. 3, LAB. 6. Pr., FY 304, FY 305, FY 306, Coreq. FY 314. Winter. Basic concepts and mathematical rationale underlying the measurement and estimation of various forest resources. Estimation of tree and stand growth and future yields.
421. **FOREST ECOLOGY (5).** LEC. 4, LAB. 3. Pr., AY 305, FY 314, 320, GL 110 or COI. Spring. Basic concepts and principles of forest ecology including forest community - environment relationships.
422. **FOREST GEOGRAPHY (2).** LEC. 2. Pr., or Coreq. FY 421. Spring. Silvical characteristics of specific tree species. Major forest types of the U.S.
423. **FOREST SITE EVALUATION (2).** LEC. 1, LAB. 3. Pr., GL 110, FY 307, junior standing. Spring. Theoretical and field training in the classification and evaluation of forest habitats and land for various uses. Overnight field trips are required.
439. **WOOD IDENTIFICATION AND PRODUCTS (3).** LEC. 2, LAB. 3. Pr., FY 301. Winter. The manufacture of lumber, plywood, paper, and various composition boards from wood. Modern production technologies used in forest products industries. Identification of important products and woods.

*The prerequisite may be waived by permission of the instructor concerned, for junior and senior students in other departments.

445. **FOREST FIRE CONTROL AND USE (3). LEC. 2, LAB. 3.** Pr., EC 202 or AEC 206, FY 421, or COI. Winter. Forest fire protection and use of fire by prescription including purpose, organization, equipment, economics, methods and tactics, public relations, and fire service management principles.
460. **WILDLAND RECREATION PHILOSOPHY AND POLICY (3).** Fall. Philosophy and policy of wildland recreation. Laws and traditions at federal, state, and local levels of government as well as industrial and other landowners' outlooks and developments relative to wildland recreation.
462. **FOREST RECREATION PLANNING AND MANAGEMENT (3). Lec. 2, Lab. 3.** Pr., FY 300, FY 301, FY 302. Spring. Planning for and management of lands which can provide recreational opportunity for people.
480. **FOREST PROBLEM I (0). LAB. 6** Pr., FY 520, 540. Offered only under the "Satisfactory/Unsatisfactory" option. Winter. Definition, analysis, and solution of a forestry oriented problem. This is the first part of a two part exercise requiring two consecutive quarters for completion. Completion of the first part with a grade of "S" is prerequisite for part II.
481. **FOREST PROBLEM II (4). LAB. 6.** Pr., FY 580, 541. Spring. Continuation of FY 480.
495. **DIRECTED STUDY (1-5 EACH).** Pr., COI, and approval of department head, junior standing. Maximum of 10 hours in all areas as credit toward the Bachelor of Science degree. Areas of study defined as in FY 691.
499. **HONORS PROJECT (2-5).** senior standing. A problem in the student's area of interest. Will test ability to do thorough library research, field work, data analysis, or other tasks related to high level independent work.

ADVANCED UNDERGRADUATE AND GRADUATE

513. **MICROTECHNIQUE OF HARD MATERIALS (5). LEC. 1, LAB. 12.** Pr., FY 311 or COI. Preparation and sectioning of hard materials for microscopic study. Care and use of the sliding microtome and diamond saw, staining, counterstaining, and mounting of sections.
517. **PHOTOGRAMMETRY (5). LEC. 3, LAB. 6.** Pr., FY 310 or COI. Spring. Use of aerial photographs in Forestry. Particular emphasis is placed on specifications for forestry photographs, basic map control, planimetric mapping, timber type mapping and timber volume estimation.
520. **SILVICULTURE (5). LEC. 3, LAB. 3.** Pr., FY 421 or COI. Fall. Methods of controlling establishment, composition, growth, and quality of forest stands. Application of ecological principles to manipulation of forest ecosystems to meet specific objectives.
525. **WOOD GLUING AND LAMINATION (5). LEC. 3, LAB. 6.** Coreq., FY 311. Pr., PS 205. Winter. Types and characteristics of woodworking glues. The theory, design, and manufacture of laminates and other glued products. The student will be introduced to research techniques and procedures by pursuing a specific study that will culminate in a comprehensive report.
526. **FOREST WATERSHED MANAGEMENT (3). LEC. 2, LAB. 3.** Pr., GL 102 and either FY 303 or AY 304 or AY 305 and BY 513. Winter. A survey of forest hydrology as a specialized branch of forest ecology. The use of forests and forestry practices for the regulation of streamflow. An overnight field trip is required.
531. **MECHANICAL PROPERTIES OF WOOD (5). LEC. 3, LAB. 6.** Pr., Spring. Mechanical properties of wood, factors affecting the strength of wood, principles used in design of wood structure. Testing procedures.
532. **SEASONING AND PRESERVATION OF WOOD (5). LEC. 5.** Pr., FY 311. Winter. Principles and practices of seasoning and impregnation of wood, study of wood destroying agencies.
533. **SEASONING AND PRESERVATION LABORATORY (2). LAB. 6.** Pr., FY 532. Spring. Required for wood technology majors only. Laboratory study of techniques and equipment used in the seasoning and impregnation of wood.
540. **FOREST ECONOMICS (4). LEC. 3, LAB. 3.** Pr., EC 202 or AEC 206, FY 415, or COI. Fall. Marginal analysis applied to forestry, investment theory and forestry decisions. Theories of resource supply and economics of conservation. The structure and performance of forest products markets. The principles and influence of taxation in forestry. The U.S. as a component of the world forest economy.
541. **FOREST MANAGEMENT AND ADMINISTRATION (4). LEC. 3, LAB. 3.** Pr., FY 520, 540. Winter. Quantitative approaches to decision making in forestry. Models for forest regulation, multiple objective planning, and other selective forestry problems. Decision making in private and public forestry firms/agencies. Administration of large forestry programs and influence of outside regulations. Course will rely heavily on previous forestry courses.
542. **FOREST POLICY (3). LEC. 3.** Pr., FY 540, FY 520 or COI. Spring. Analysis of the major social and resource characteristics of the forest regions of the U.S. Identification of policy issues at regional and national levels. Historical aspects of the U.S. forest policy. Analysis of major policy institutions.
548. **ADVANCED FOREST ECONOMICS (3). LEC. 3.** Pr., FY 537. Winter. Input-output relationships in forest production. Computation of financial maturity of trees and stands. Competition for resources in the management of forest properties. Uses of land and evaluation of intangible values associated with land.
570. **HARVESTING (3). LEC. 2, LAB. 3.** Pr., IE 204, FY 520, 540. Winter. Harvesting systems, cost analysis, and environmental impacts.
590. **SEMINAR IN FORESTRY (1).** Pr., Senior standing. Required of all graduate students in forest management and wood technology and all seniors in the Honors Program. Advanced current literature and recent developments, with written and verbal reports on selected problems.

601. **WOOD CHEMISTRY (5). LEC. 2, LAB. 9.** Pr., FY 330, CH 207 or TE 424. Detailed physical and chemical nature of cellulose and modified cellulose and their derivatives. Study of the lignocellulose complex. Chemical analysis of wood.
610. **FOREST TREE IMPROVEMENT (5). LEC. 4, LAB. 3.** Pr., ZY 300 or COI. Principles of heredity as applied to forest trees and their management. Review of current knowledge in tree improvement. Principles of forest tree breeding. Study and evaluation of activities designed to produce genetically improved trees.
611. **FOREST SOILS (5). LEC. 3, LAB. 6.** Pr., AY 304 or 305. Importance of morphological, physical and chemical properties of forest soils in relation to growth of trees. Classification of forest soils on the basis of productivity. Special emphasis on forest soils in the southern pine region.
613. **FOREST COMMUNITY INVESTIGATIONS (5). LEC. 2, LAB. 6.** Pr., GL 102, or AY 304 or 305; FY 307 or BY 513. Methods of detecting, measuring, describing and analyzing forest communities and community types. Application to the study of forest ecosystems.
617. **REMOTE SENSING (3). LEC. 2, LAB. 3.** Pr., PS 206 or PS 221, BY 513 or equivalent, and COI. Spectral regions. Reflectance and emission of electro-magnetic energy. Types of remote sensing systems, including: photographic, in the visible and infrared spectral regions; line-scanning in the visible, infrared, and microwave spectral regions; and radar. The applications of remote sensing imagery to non-urban management.
691. **DIRECTED STUDY (1-5).** Directed Study limited to a maximum of 5 hours in any specified area and to a maximum of 15 hours in all areas as credit towards the Master of Science degree. All quarters. Areas of Directed Study: (A) Forest Management, (B) Forest Economics, (C) Forest Sampling, (D) Regression Analysis, (E) Linear Programming, (F) Forest Photogrammetry, (G) Forest Mensuration, (H) Forest Engineering, (I) Forest Soils, (J) Forest Ecology, (K) Forest Genetics, (L) Tree Physiology, (M) Wood Anatomy & Quality, (N) Uses of Wood & Derived Products, (O) Chemistry of Wood Glues, Finishes, & Impregnants, (P) Timber Physics, (Q) Recreation, (R) Remote Sensing, and (S) Wood Procurement.
695. **SPECIAL PROBLEMS (3-8).** Area of study defined in FY 691. All quarters. A special problem in forestry or wood utilization. Such a problem will be of lesser magnitude than a thesis but will test the student's ability to do thorough library research as well as any needed laboratory or field work, and to prepare a comprehensive report on his findings. This work may be spread over more than one quarter, but shall be limited to a total of eight quarter hours.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Foundations of Education (FED)

Associate Professors Spencer, *Head*, Greenshields, G. W. Halpin, Lauderdale, Littleford, Robison, and Wilmoth

Assistant Professors Brogdon, Deaton, Gamble, G. M. Halpin,

Hilyer, Miller, Morris, Rudder, Schuessler, and Trentham

Instructors Guthery, Herring, and McCullers

Adj. Assistant Professor Bryan

Adj. Instructor Warner

213. **HUMAN GROWTH AND DEVELOPMENT (5). LEC. 4, LAB. 2.** Pr., sophomore standing. Teacher and the school in the direction, measurement, and evaluation of individual growth and development by using various sociological, philosophical, and psychological theories. Laboratory experiences required.
214. **PSYCHOLOGICAL FOUNDATIONS OF EDUCATION (5). LEC. 4, LAB. 2.** Pr., sophomore standing. The psychological dimensions of the educational process. The processes, conditions, and evaluation of learning, and related methodologies of teaching. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements, Sect. C under School of Education.
300. **EDUCATIONAL PSYCHOLOGY (5). LEC. 4, LAB. 2.** Pr., sophomore standing. Learning and motivation from a developmental perspective for the purpose of gaining insight into an understanding of the learning process and of the individual involved in this process. This experience provides an integrated theoretical base for educational practice.
320. **SOCIAL FOUNDATIONS OF EDUCATION (5). LEC. 4, LAB. 2.** Pr., junior standing. The relationship of the school and contemporary society and the influence of cultural heterogeneity upon the teaching-learning process. Laboratory experiences focus upon mastering basic tools for studying the school as a dynamic social system.
350. **CULTURAL FOUNDATIONS OF EDUCATION (5). LEC. 5.** Pr., junior standing. Analysis of education giving emphasis to the act of teaching both in theory and practice. Regardless of disciplinary emphasis, the concerns of educational purpose, curriculum and pedagogy will be the focus of the courses. Students will select one of the following disciplinary options: (a) philosophy of education, (b) history of education, (c) social foundations of education, (d) comparative education.
400. **MEASUREMENT AND EVALUATION IN EDUCATION (5). LEC. 4, LAB. 2.** Pr., FED 300 or equivalent and junior standing. Measurement and evaluation as an integral part of the teaching-learning process. Focus is on (a) identifying and defining intended learning outcomes, (b) constructing or selecting tests and other evaluation instruments that are relevant to specified outcomes, and (c) interpreting and using results in determining attainment of educational goals and improving learning and instruction.
480. **PHILOSOPHICAL FOUNDATIONS OF EDUCATION (5).** Pr., FED 320 or equivalent. Educational movements and ideas in Western culture which influence modern educational practices. Evaluation of laboratory experiences and the Professional Internship through philosophical analysis of educational concepts and problems.

ADVANCED UNDERGRADUATE AND GRADUATE

510. **MEASUREMENT AND EVALUATION OF THE INDIVIDUAL IN EDUCATION (5).** Pr., FED 400 or COI. An in-depth study of the principles and techniques of measurement and evaluation which are applicable to educational settings. Emphasis will be given to both the theoretical and the practical. Special problems and issues will also be examined.
520. **EDUCATIONAL SOCIOLOGY (5).** Pr., FED 320 and SY 201 or equivalents. The school as a social institution. Group interaction, formal and informal structure and organization, and the relationship of education to other social institutions.
534. **PERSONALITY DYNAMICS AND EFFECTIVE BEHAVIOR (5).** Pr., ten hours of psychology. Analysis of adaptive and maladaptive behavior. Not open to students majoring in psychology.

GRADUATE

600. **EDUCATION IN MODERN SOCIETY (5).** Pr., graduate standing. The interaction of historical, philosophical and sociological considerations affecting education in modern society.
601. **SOCIAL FOUNDATIONS OF EDUCATION (5).** Pr., graduate standing. Man as a social being, his social relationships and inventions, and value patterns. Directions and support of educational developments in relation to various socio-economic structures.
602. **SOCIAL CHANGE AND EDUCATIONAL DEVELOPMENT (5).** Pr., graduate standing. Major current theories of social change and their practical application in improving the school and directing social innovations which sustain educational improvements.
603. **SOCIAL AND CULTURAL DIVERSITY AND AMERICAN EDUCATION (5).** An investigation of the educational responses to social and cultural pluralism in contemporary American society.
605. **URBANIZATION AND EDUCATIONAL DEVELOPMENT (5).** Pr., FED 600. Developments in the concentration of population, wealth, and cultural dissemination in urban areas. The changing character of this concentration, and its impact on educational agencies regarding different population groups and different areas of educational service.
617. **ADVANCED EDUCATIONAL PSYCHOLOGY (5).** Pr., FED 213 and 214 or equivalents. (Not open to students with credit in FED 451.) The psychological bases of learning. Particular emphases are the development and modification of cognitive and affective behavior.
634. **HISTORY OF EDUCATION (5).** Pr., FED 600. The emergence of education as a formal institution; tracing its historical development from early Greek times to the present and emphasizing the historical antecedents which have helped to shape the role and functions of education in Western culture.
636. **PHILOSOPHY OF EDUCATION IN AMERICA (5).** Pr., FED 600. Major American contributions to the philosophy of education and their influence on educational practice. Need for, and procedures in, reexamining concepts in the light of recent scientific and cultural developments.
637. **DEVELOPMENT AND STATUS OF EDUCATIONAL PHILOSOPHY (5).** Pr., FED 600; 636 or consent of department head. Development of philosophy of education from the standpoint of its implications for educational practice. Several patterns of thought are considered including supernaturalism, idealism, realism, humanism, communism, existentialism, and experimentalism.
639. **COMPARATIVE EDUCATION (5).** Pr., FED 600; two quarters of graduate study or consent of department head. Comparative study of selected educational systems in nations in various stages of development. Special attention given to American educational issues in cross cultural contexts.
645. **CURRENT PROBLEMS AND ISSUES IN THE FOUNDATIONS OF EDUCATION (5).** Pr., teaching experience. Selected issues in the sociological, psychological, historical and philosophical foundations of education which affect the total educational enterprise and its relation to society.
647. **FOUNDATIONS IN CURRICULUM AND TEACHING (5).** Curriculum patterns and teaching materials reviewed in terms of recent investigations and experimentation; conflicting conceptions of the nature of the curriculum and the sociological, philosophical and psychological implications of these conflicts; methods of curricular reorganization in the elementary and secondary schools.
650. **SEMINAR IN FOUNDATIONS OF EDUCATION (3-10).** May be repeated for credit not to exceed 10 hours. Historical, philosophical, sociological, psychological, and research issues and their impact on education.
661. **RESEARCH AND EXPERIMENTATION IN EDUCATION (5).** Research methods, design of experiments, and evaluation; data sources, research planning, elements of scientific method and proposal writing. Current trends in educational research.
662. **NONPARAMETRIC STATISTICAL ANALYSIS (5).** Pr., FED 661. (Credit not allowed to meet minimum research requirements for doctoral students). Common nonparametric statistical tests with special emphasis on nominal and ordinal data; estimation and multi-sample designs; emphasis on education applications and statistical models.
672. **STATISTICAL METHODS IN EDUCATION (5).** The need and importance of applying statistical methods to the study of educational problems, statistical methods appropriate to education, and interpretation of meanings of statistical analyses.
673. **RESEARCH AND EXPERIMENTAL DESIGN (5).** Pr., FED 672. Relationship of design to validity; significance of variables, testing hypotheses, evaluation of research and research findings.

675. **ADVANCED STATISTICAL METHODS IN EDUCATION (5).** Pr., FED 672. Analysis of variance and covariance; correlation analysis and linear regression. Simple and complex factorial designs applied to educational research.
676. **ADVANCED RESEARCH AND EXPERIMENTAL DESIGN (5).** Pr., FED 675. An extensive examination of the nature and character of experimental design in educational research including the development of appropriate analytical techniques.

Geography (GY)

Assistant Professors Bagwell, *Acting Head*,
Dawsey, Dorman, Icenogle, and Jeane

102. **WORLD GEOGRAPHY (5).** Man and his work in relation to the Earth as a planet, location, climate, land forms, water bodies, minerals, soils, biota.
214. **PHYSICAL GEOGRAPHY (5).** Selected elements of the earth's physical system to include such items as landforms, basic weather elements, soils, and vegetation.
215. **CULTURAL GEOGRAPHY (5).** Selected elements of cultural geography to include basic concepts, review of literature, and influence of man in changing the face of the earth.
300. **WEATHER AND CLIMATE (5).** Weather and climate: causes and controls. Characteristics and distribution of world climates and their economic and social effects. Not open to students having credit for GY 213.
302. **ECONOMIC GEOGRAPHY (5).** Distribution and environmental relationships of man's principal economic activities.
303. **THE SOVIET UNION—LAND AND PEOPLE (5).** General elective. The physical and human geography of the U.S.S.R. and its role in international affairs.
304. **LATIN AMERICA—LAND AND PEOPLE (5).** A regional survey of economic and social developments, resources and products.
305. **THE UNITED STATES AND CANADA—LAND AND PEOPLE (5).** Human-use regions, resources, social and economic developments will be studied.
306. **EUROPE—LAND AND PEOPLE (5).** The influences of climate, surface features, and natural resources on the distribution of peoples, their industries and routes of trade. Consideration will be given to each country within its regional setting and to the relationship of Europe to the remainder of the world.
307. **ASIA—LAND AND PEOPLE (5).** Climate, topography, and natural resources and their influence upon the distribution of peoples, industries and commerce.
308. **AFRICA—LAND AND PEOPLE (5).** The principal regions of Africa with particular emphasis on the areas and countries of greater economic and international importance.
313. **COASTAL CLIMATOLOGY. (2 SM. HRS., 3 QTR. HRS.)** An introduction to the physical factors which result in climatic conditions of coastal regions, with emphasis on the northern Gulf of Mexico. No prerequisites.
315. **ALABAMA—LAND AND PEOPLE (5).** Geographic elements comprising the resource base for the state's economy.
401. **THE GEOGRAPHY OF INTERNATIONAL RELATIONS (5).** General elective. The interaction between the natural-physical environment and the international activities of world powers. Emphasis on the changing geographic and economic patterns in world affairs.
440. **CARTOGRAPHY (5).** Techniques of map construction, with attention given to both the drafting and interpretation of maps and other graphic presentations.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **HISTORY OF GEOGRAPHIC THOUGHT (5).** The development of modern geographic thinking with special attention to the methodology employed in the science of geography.
504. **ADVANCED PHYSICAL GEOGRAPHY (5).** Pr., COI or GY 214. Geomorphological approach to the study of landforms in addition to in-depth analysis of earth systems.
505. **ADVANCED CULTURAL GEOGRAPHY (5).** Pr., COI or GY 215. Analysis of selected themes within the general field of cultural geography that illustrate man-land relationships.
507. **RESOURCES AND ENVIRONMENT. (5).** An examination of the relationship between man and his physical environment emphasizing his use of natural resources and his impact on the land, sea, and atmosphere.
510. **ALABAMA—RESOURCES AND PROBLEMS (5).** Inventory and problematic aspects of Alabama resources, both human and natural.
520. **URBAN GEOGRAPHY (5).** The location, character, and growth of urban centers, with special attention to their interior patterns of land use and cultural development.
560. **DEVELOPMENT LOCATION ANALYSIS. (5).** Introduction to the location of economic activity and an analysis of site decision making frameworks involving several types of developments.

GRADUATE

600. **SEMINAR IN CULTURAL GEOGRAPHY (5).** Pr., COI, or graduate standing. Designed for intensive study and analysis of selected themes within the broad field of cultural geography.
650. **GEOGRAPHY SEMINAR (5-10).** Pr., COI or graduate standing. Designed for students in intensive study and analysis of problems in geography.

Geology (GL)

Professor Carrington, *Head*
 Adjunct Professor Jones
 Associate Professor Cook
 Assistant Professors Fouts, Gastaldo,
 Samman, Taylor, and Womochel
 Instructors Gilbert and Sears

101. **INTRODUCTORY GEOLOGY I (5).** LEC. 4, LAB. 2. All quarters. The origin and classification of rock-forming and ore minerals. Sedimentary, metamorphic, and igneous processes, and classification of rocks that result from such processes. Rock deformation and mountain building. Not open to students having credit in GL 110.
102. **INTRODUCTORY GEOLOGY II (5).** LEC. 4, LAB. 2. Pr., GL 101. All quarters. Geomorphology through study of weathering, mass movement, formation of soils, and the erosional, transportational, and depositional aspects of groundwater, streams, oceans, glaciers, and wind. Not open to students having credit in GL 110.
103. **HISTORICAL GEOLOGY (5).** LEC. 4, LAB. 2. Pr., GL 102 or 110. Physical and biological history of the earth, with emphasis on the evolution of life forms.
110. **PHYSICAL GEOLOGY (5).** LEC. 4, LAB. 2. All quarters. An accelerated course in general geology for the student with an interest and/or aptitude in natural sciences. Survey of the important minerals and rocks with emphasis on the processes that effect their formation and destruction. Origin and classification of geologic structures. Not open to students having credit in GL 101 or GL 102.
205. **PALEOBOTANY (5).** LEC. 4, LAB. 2. Pr., BI 102, sophomore standing. Fall. Morphology, anatomy, evolution, and stratigraphy of fossil plants, including microscopic fossils.
206. **INVERTEBRATE PALEOZOLOGY (5).** LEC. 4, LAB. 2. Pr., BI 103, sophomore standing. Winter. Morphology, classification, and significance of selected genera representative of the diversity of fossil invertebrates, including microscopic fossils.
210. **APPLICATIONS OF PALEONTOLOGY (5).** LEC. 4, LAB. 2. Pr., GL 205 and 206, sophomore standing. Spring. The principles and techniques of paleontology will be considered: fossilization, speciation, evolution, paleoecology, paleogeography, and biostratigraphy.
215. **GEOLOGICAL FIELD METHODS (4).** LAB. 12. Pr., GL 110 and TS 102 or COI. Summer. Instruments and methods used in geological field mapping. Final report required.
231. **INDEPENDENT GEOLOGICAL MAPPING (2).** LAB. 5. Pr., GL 215, sophomore standing. All quarters. Independent mapping project of limited extent done with the consent and under the direction of a faculty member. A geological map and report must be completed, summarizing the investigation of the area chosen.
301. **MINERALOGY (5).** LEC. 4, LAB. 2. Pr., CH 103, junior standing. Fall. Introduction to crystal chemistry and crystallography. Systematic study of representatives of important metallic and non-metallic mineral groups.
302. **OPTICAL MINERALOGY (5).** LEC. 4, LAB. 2. Pr., GL 301, junior standing. Winter. Theory and application of polarized light optics as applied to mineral identification, with emphasis on the study of rock-forming silicate minerals in thin sections.
305. **IGNEOUS AND METAMORPHIC PETROLOGY (5).** LEC. 4, LAB. 2. Pr., GL 302, junior standing. Spring. Principles and processes of intrusive and extrusive igneous activity and metamorphism. Description and classification of igneous and metamorphic rocks.
401. **SEDIMENTARY PETROLOGY (5).** LEC. 4, LAB. 2. Pr., GL 302, junior standing. Fall. Detailed description and classification of sedimentary rocks, with emphasis on the processes of sediment transportation, deposition and diagenesis in marine and non-marine environments.
402. **STRUCTURAL AND GEOTECTONIC PRINCIPLES (5).** LEC. 3, LAB. 4. Pr., GL 110 and 215, junior standing. Winter. Principles and processes of rock deformation, including description and classification of rock structures and methods of analysis. General history of the development of North America through understanding of plate tectonics and structural developments.
411. **STRATIGRAPHY (5).** LEC. 3, LAB. 4. Pr., GL 401 and 402, junior standing. Spring. Descriptive geology pertaining to the discrimination, character, thickness, sequence, age, and correlation of rocks. Particular emphasis on field study of stratified rocks.
421. **ECONOMIC GEOLOGY (5).** LEC. 4, LAB. 2. Pr., GL 305, 401 and 402, junior standing. Spring. The origin, distribution and classification of mineral deposits formed by igneous, metamorphic and sedimentary (or secondary) processes. Introduction of methods of exploration and development.
431. **RESEARCH METHODS AND APPLICATION (1-4).** Pr., senior majoring in geology and/or consent of departmental faculty upon receipt of acceptable proposal. All quarters. Active participation in some phase of original research under supervision of a senior investigator. Credit evaluation determined by the departmental faculty on the basis of the formal presentation of the problem and the probable method(s) of investigation. May be taken more than one quarter for a maximum cumulative credit of four credit hours.

The following courses are available during Summer quarters at the Dauphin Island, Alabama, Sea Laboratory, and at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi. Application forms must be obtained from the Department of Geology during final registration for the Winter Quarter preceding intended attendance.

Courses At Dauphin Island Sea Laboratory

120. **MARINE TECHNICAL METHODS I (3). LAB. 8.** Summer only. Pr., COI. Introduction to instruments and procedures utilized aboard marine research vessels, including physical, biological and geological measurements and sampling techniques.
121. **MARINE TECHNICAL METHODS II (3). LAB. 8.** Summer only. Pr., COI. Introduction to laboratory methods associated with chemical parameters of "nutrient analysis." Shipboard and practical skills developed.
202. **INTRODUCTORY MARINE GEOLOGY (6). LEC. 4, LAB. AND FIELD 4.** Summer only. Pr., Physical Geology and COI. Sedimentary environments, seafloor topography and history of ocean basins. Sampling and laboratory techniques and relationship of biota to sediment substrate.
501. **RECENT MARINE SEDIMENTATION (6). LEC. 4, LAB. 4.** Summer only. Pr., GL 202 or ZY 210 or ZY 330 or COI. Properties of marine sediments, coastal environments, continental margins, reefs, and the deep sea. Monitoring and measuring of shoreline changes.
502. **PROBLEMS IN MARINE PALEOECOLOGY (6). LEC. 4, LAB. 4.** September Preterm, alternate years. Pr., GL 101-102 or GL 110 and GL 206 or COI. Survey of principal Mesozoic and Cenozoic marine fossil groups, their paleoecology, and paleogeography.
503. **MARINE GEOCHEMISTRY (6). LEC. 4, LAB. 4.** September Preterm, alternate years. Pr., CH 103-104-105 or 111-112-113 or COI. Principles governing the distribution of chemical variables in the ocean. Techniques include the application of chemical equilibria calculations and shipboard instrumental procedures.

Courses at Gulf Coast Research Laboratory

440. **PHYSICAL MARINE GEOLOGY (5). LEC. 2, LAB. 5.** Pr., consent of departmental adviser, junior standing. Summer only. General introduction to the physical processes resulting in the coastal morphology of Mississippi Sound, emphasizing erosional and depositional effects of waves and currents. Various environmental types (deltas, estuaries, etc.) and their characteristics are studied. Identification of ancient shorelines and ancient environments.
441. **CHEMICAL MARINE GEOLOGY (5). LEC. 2, LAB. 5.** Pr., consent of departmental adviser, junior standing. Summer only. Overview of the chemical systems in the oceans, with special emphasis on near-shore marine and estuarine environments. Basic analytical methods currently used to study the marine environment, with a strong concentration on instrumental methods of analyzing natural waters and sediments. Supervised research on chemical systems in the local estuaries, Mississippi Sound, and offshore.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **PRINCIPLES OF GEOCHEMISTRY (5). LEC. 3, LAB. 4.** Pr., CH 105 or equiv. Fundamentals of chemistry as applied to geologic processes and solution of geologic problems. Survey of origin and distribution of elements in the solid earth. Laboratory emphasizes specific problems related to student's research interests.
510. **ADVANCED PALEOBOTANY (5). LEC. 3, LAB. 4.** Pr., GL 205 or COI. Detailed investigations of plant assemblages of the Upper Carboniferous of North America. Emphasis primarily on fossil plant from the Pottsville Formation of Alabama and adjacent states. Laboratory emphasis will be on paleobotanical techniques.
520. **MICROPALAEONTOLOGY (5). LEC. 3, LAB. 4.** Pr., BI 103, GL 103 or COI. Morphology, classification and biostratigraphic use of specific microfossil groups, including foraminifera, ostracodes and conodonts. Laboratory emphasis on collection, preparation and systematics of microfossils.
530. **COAL TECHNOLOGY (5). LEC. 4, LAB. 2.** Pr., GL 110 or COI. Introduction to origin, occurrence, exploration, development and beneficiation of coal. Emphasis on coal petrology as applied to rank, maceral and utilization parameters.

GRADUATE

610. **ADVANCED STRUCTURAL GEOLOGY (4). LEC. 3, LAB. 2.** Pr., GL 402. Application of analytical techniques to microscopic, mesoscopic and megascopic deformational features of rocks. Lab emphasis on solution of local problems.
640. **SPECIAL TOPICS IN ECONOMIC GEOLOGY (4). LEC. 3, LAB. 2.** Pr., GL 421 or COI. The practical and theoretical aspects of economic geology as applied to exploration and development of natural resources, particularly fuels, base metals and precious metals. Emphasis on specific case histories, preparation of maps and reports, and the analysis of drill-recovered, geochemical and geophysical data.
650. **ADVANCED STRATIGRAPHY (4). LEC. 3, LAB. 2.** Pr., GL 411. Chronologic study of Paleozoic, Mesozoic and Cenozoic rocks, their tectonic setting and paleogeography. Special emphasis on field problems.

660. **IGNEOUS PETROLOGY (4). LEC. 3, LAB. 2.** Pr., GL 305. Classification of igneous rocks. Origin, composition, and properties of magmas. Genesis of the major igneous rock associations. Petrochemistry.
661. **SEDIMENTOLOGY AND SEDIMENTARY PETROLOGY (5). LEC. 4, LAB 2.** Pr., GL 401 (or 502) and 411. Selected readings, lectures, and group discussion of significant papers on processes of sedimentation and diagenesis. Emphasis on interpreting depositional and post-depositional history of specific rocks. Analytical techniques and microscopic analysis of evaporites, carbonates, and clastics.
662. **METAMORPHIC PETROLOGY (4). LEC. 3, LAB. 2.** Pr., GL 305. Metamorphic zones, facies and reactions. Applications of experimental data to metamorphic rock genesis. Studies of selected metamorphic rocks in the southern Piedmont.
670. **SEMINAR I—SOUTHEASTERN GEOLOGY (1).** Fall. Reports and discussion covering general topics of regional geologic interest as well as specific geologic problems unique to the southeastern U.S. Emphasis on geologic history, economic, structural and stratigraphic topics.
671. **SEMINAR II—URBAN AND ENVIRONMENTAL GEOLOGY (1).** Winter. Reports and discussion on specific urban and environmental geologic problems with emphasis on those of special importance to the southeastern U.S.
672. **SEMINAR III—GEOTECTONICS (1).** Spring. Reports and discussion on the principles, patterns and classification of tectonic phenomena.
680. **A,B,C,D,E,F,G. DIRECTED STUDIES (1-4).** Pr., COI. All quarters. Non-thesis credit research in areas not currently offered as, or to supplement, lecture courses. Requires written final report. May be taken more than one quarter for a maximum cumulative credit of four credit hours. A. Economic Geology—Coal Technology. B. Geophysics. C. Igneous, Metamorphic Petrology—Geochemistry. D. Paleontology. E. Sedimentary Petrology—Stratigraphy. F. Structural Geology—Geotectonics. G. Urban and Environmental Geology.
699. **THESIS (2).** All quarters. May be taken more than one quarter for a maximum cumulative credit hours.

Health, Physical Education and Recreation (HPR)

Professors Fourier, *Head*, and Means

Associate Professors Davenport, Dragoin, Fitzpatrick, Ford, Moore, Puckett and Wilson

Assistant Professors Bengtson, Cherellia, Daniels, McLaughlin,

Newkirk, Reeve, Rosen, Waldrop, Washington, and Young

Instructors Harmon, Lorendo, Milkovich, Murphy, Nunnally, Penney, and T. Woehrlie

Adj. Instructors Brown, Curry, Drummond, and Parker

The instructional program of the Department of Health, Physical Education and Recreation comprises (1) courses in physical education for students in the University liberal education program; (2) courses for students majoring or minoring in health education, physical education, and recreation administration; and (3) courses for students in preparation for teaching.

University Physical Education Requirements

Three quarters of physical education are required by the University for graduation. Any deficiencies in physical education incurred at Auburn University or elsewhere must be cleared prior to graduation. Only one credit per quarter is permitted or transferable to meet the three-quarter requirement.

Health Classification. A student who has completed a Physical Education Classification Form indicating a physical restriction must report to the Physical Education Office, 2050 Memorial Coliseum, for counseling and assignment of a health card indicating suitable classes. Students may request re-classification whenever changes in health status or physical condition occur.

Course Requirements: All students are required to take PE 101, Foundations of Physical Education. THOSE WHO DO NOT HAVE SUFFICIENT SKILL IN SWIMMING TO ASSURE THEIR OWN SAFETY IN AND AROUND WATER ARE REQUIRED TO TAKE PE 102, Swimming for the Non-swimmer (Department of Health, Physical Education, and Recreation administers a test to determine each student's swimming ability.) Students who take swimming choose one course from Group I or II listed below for their third quarter's work. Students who do not take a swimming course must select one course from Group I and one course from Group II in completing their three quarters of physical education.

Students with physical restrictions are required to take PE 101, Foundations of Physical Education. An individualized program will be provided. During subsequent quarters they are expected to meet the other requirements stated above as nearly as medical restrictions will allow. Specific course selection should be made on the recommendations of the Department of Health, Physical Education and Recreation.

Full participation in the Band should substitute for one of the three required quarters. Band members should complete the last two-thirds of the Physical Education sequence; swimming and one other course, or one from Group I and II if student passes the swimming classification test.

Students with six months to one year military service receive credit for PE 101, more than one year of service are exempted from all Physical Education requirements with one exception; swimming should be completed unless the student passes the departmental proficiency test.

The extent of participation in the required Physical Education program for students over 26 years of age should be judged by their Academic Deans; unless all or part of the requirement is waived by the Dean, these students should enroll for the last two-thirds of the required sequence.

Varsity athletics scheduled in season for three quarters satisfies the three quarters requirements. Each should pass the departmental proficiency swimming test or enroll in PE 102 Swimming for the Non-swimmer.

Credit. All courses carry one hour credit per quarter (maximum of six quarter hours allowed on degree). No student may receive credit for a course in which the person has previously earned credit.

Students may not register for a beginning level course (Groups I and II) after having earned credit in the sport or dance area on an advanced level (Group III). Credit cannot be earned for a 200-and a 300-level course in the same sport.

Electives. Three quarter hours credit may be earned in addition to the three quarter hours required. Elective courses may be chosen from Group I, II, and III.

101. **FOUNDATIONS OF PHYSICAL EDUCATION (1).** Understanding the relationship of human movement to body efficiency, aesthetics and health; self-appraisal; development of a personal plan for achieving and maintaining physical condition; selection of a personal program of developmental and recreational activities.
102. **SWIMMING FOR THE NON-SWIMMER (1).** Knowledge and skill in aquatics which are developed to a level sufficient to support a recreational interest and to assure one's own safety and the safety of others in and around water.
103. **INDIVIDUALIZED AQUATICS (1).** Provides water therapy, an understanding of adaptive movements, and aquatic skills.
107. **SPORTS AND DANCE IN AMERICAN CULTURE (1). (ATYPICAL).**
115. **ADAPTED PHYSICAL EDUCATION (1).** Concerned with the improvement and correction of physiological and anatomical remedial defects.

Group I (Vigorous)*

116. **WEIGHT CONTROL (1).** Caloric intake-output, nutrition, and the development of desirable exercise and nutritional habits. Activities selected according to individual needs and limitations. Open to students with health classifications "A", and "B".
117. **AEROBIC DANCE (1).**
125. **BASKETBALL (1).**
127. **SOCCER-SPEEDBALL (1).**
131. **FENCING (1).**
132. **WRESTLING (1).**
134. **JUDO (1).**
135. **WEIGHT TRAINING (1).**
136. **TRACK (1).**

*Vigorous activities having special value with respect to development and maintenance of physical conditions.

- 137. **HANDBALL (1).**
- 138. **RACQUETBALL (1).**
- 139. **WILDERNESS SKILLS (1).**
- 140. **APPARATUS (1).** Understanding of gymnastics and skill in the use of different apparatus.
- 141. **TRAMPOLINE (1).**
- 142. **TUMBLING (1).**
- 144. **MODERN DANCE (1).** An understanding of dance as an art form.
- 145. **MODERN DANCE II (1).** Pr., PE 144 or equivalent.
- 146. **TAP DANCE (1).**
- 147. **BALLET (1).** Fundamentals and terminology of classical ballet.
- 148. **BALLET II (1).** Pr., PE 147 or equivalent.
- 149. **JAZZ DANCE (1).** Pr., COI.
- 230. **LIFE SAVING (1).** Pr., COI. Skills leading to certification in Red Cross Senior Life Saving.
- 231. **SKIN DIVING (1).** Pr., COI. Underwater swimming includes selection and use of swim fins, mask, snorkel. Underwater physiology and safety are emphasized.
- 234. **JUDO II (1).** Pr., PE 134 or equivalent.
- 238. **RACQUETBALL II (1).** Pr., PE 138 or equivalent.

Group II (Recreational Skills)**

- 150. **INTERMEDIATE SWIMMING (1).** Pr., COI.
- 153. **SPRINGBOARD DIVING (1).** Pr., COI. Instruction in the basic dives; front, back, inward, reverse, and twist.
- 154. **RECREATIONAL SPORTS AND ACTIVITIES (1).** Survey of selected recreational pursuits such as billiards, croquet, darts, gym bowling, hiking, horseshoes, net games, and shuffleboard.
- 155. **ANGLING (1).** Skills in bait and fly casting. Selection and care of tackle.
- 156. **ARCHERY (1).**
- 157. **BADMINTON (1).**
- 158. **BOWLING (1).** Additional \$20.00 fee is payable to cooperating agency.
- 159. **GOLF (1).** Additional \$20.00 fee is payable to cooperating agency.
- 162. **RIFLE MARKSMANSHIP (1).**
- 163. **TENNIS (1).**
- 165. **CAMPING (1).** Understanding of American heritage in relation to the out-of-doors, camping trends, conservation, and the development of camping skills.
- 166. **FAMILY RECREATION (1).** Leisure time activities suitable for the family.
- 168. **BASIC EQUITATION (1).** Additional \$75.00 fee is payable to cooperating agency.
- 170. **FOLK DANCE (1).**
- 172. **SOCIAL DANCE (1).** Mixers, as well as ballroom dancers: foxtrot, waltz, rhumba, tango, and other representative Latin dances.
- 180. **SOFTBALL (1).**
- 181. **VOLLEYBALL (1).**
- 250. **SYNCHRONIZED SWIMMING (1).** Pr., COI.
- 259. **GOLF II (1).** Pr., PE 159 or equivalent. Additional green fee to be paid to cooperating agency.
- 263. **TENNIS II (1).** Pr., PE 163 or equivalent.

**Activities having special value as healthful, lifetime recreational pursuits.

Group III (Varsity)

- 325. VARSITY BASKETBALL (1).
- 326. VARSITY FOOTBALL (1).
- 332. VARSITY WRESTLING (1).
- 336. VARSITY TRACK (1).
- 337. VARSITY CROSS COUNTRY (1).
- 340. COMPETITIVE AND EXHIBITIONAL GYMNASTICS (1).
- 350. VARSITY SWIMMING (1).
- 359. VARSITY GOLF (1).
- 362. VARSITY RIFLERY (1).
- 363. VARSITY TENNIS (1).
- 379. VARSITY SOFTBALL (1).
- 380. VARSITY BASEBALL (1).
- 381. VARSITY VOLLEYBALL (1).

Courses for the Major and the Minor

- 118. SKILLS AND CONCEPTS OF INDIVIDUAL AND DUAL ACTIVITIES I (3). LAB. 6. Track and Field, archery, golf, wrestling and other individual and dual activities.
- 119. SKILLS AND CONCEPTS OF INDIVIDUAL AND DUAL ACTIVITIES II (3). LAB. 6. Tennis, badminton, racquetball, squash and handball.
- 120. SKILLS AND CONCEPTS OF GYMNASTICS (4). LAB. 8. Tumbling, trampoline and apparatus.
- 121. SKILLS AND CONCEPTS OF AQUATICS (2). LAB. 4. Strokes, survival swimming techniques, competitive swimming, springboard diving, and other aquatic activities.
- 122. SKILLS AND CONCEPTS OF TEAM SPORTS (3). LAB. 5. Power volleyball, soccer, speedball, basketball, softball, field hockey and other team sports.
- 123. SKILLS AND CONCEPTS OF DANCE (4). LAB. 8. Contemporary, folk, square, tap and ethnic dance.
- 195. HEALTH SCIENCE (3). Basic understanding concerning sound health practices and protection. Physical, mental, and social aspects of personal and community health are considered.
- 201. HISTORY AND PRINCIPLES OF PHYSICAL EDUCATION (3).
- 202. BASKETBALL (MEN) (3). LEC. 2, LAB. 2. Fall. The fundamental skill techniques of basketball—offense, defense, and strategy.
- 203. BASEBALL (3). LEC. 2, LAB. 2. Offensive and defensive strategy, pitching, catching, infielding, outfielding, batting and baserunning.
- 204. TRACK AND FIELD (3). LEC. 2, LAB. 2. Fundamental skills and techniques of track and field athletics. The organizing and conducting of track meets.
- 206. FOOTBALL (MEN) (3). LEC. 2, LAB. 2. Winter. The fundamentals of football and the different types of offense, defensive team strategy and generalship.
- 207. CONDUCT OF DANCE FOR HIGH SCHOOL AND RECREATION PROGRAMS (3). LEC. 2, LAB. 2.
- 208. THEORY AND CONDUCT OF TEAM SPORTS FOR WOMEN (3). LEC. 2, LAB. 2.
- 209. THEORY AND CONDUCT OF INDIVIDUAL AND DUAL SPORTS (3). LEC. 2, LAB. 2.
- 210. THEORY AND CONDUCT OF GYMNASTICS (3). LEC. 2, LAB. 2.
- 211. SENSORIMOTOR ACTIVITIES (3). LEC. 2, LAB. 2. Designed to develop understandings and skills concerning the broad concept of sensorimotor experiences for children, ages 4-8.
- 212. ELEMENTARY SCHOOL ACTIVITIES (3). LEC. 2, LAB. 2. Physical education activities suitable for the first six grades including teaching devices.
- 213. DANCE FOR CHILDREN (3). LEC. 2, LAB. 2. Includes all forms of dance suitable for elementary school age children with emphasis on creative dance activities which afford a progression in dance skills.
- 224. FOOTBALL OFFICIATING (1). LAB. 3.
- 225. BASKETBALL OFFICIATING (1). LAB. 3.

226. **SOFTBALL OFFICIATING (1). LAB. 3.**
227. **VOLLEYBALL OFFICIATING (1). LAB. 3.**
282. **PRINCIPLES OF RECREATION (3).** The significance and meaning of leisure; theories of play, the recreation movement in the United States. Principles of program planning and development at state and local levels of government, in schools and in industry.
295. **SCHOOL AND COMMUNITY HEALTH (3).**
315. **KINESIOLOGY (4). LEC. 3, LAB. 2.** Pr., ZY 250-251, Physics 200.
316. **EVALUATION AND MEASUREMENT IN HEALTH, PHYSICAL EDUCATION (3).**
351. **WATER SAFETY (3). LEC. 1, LAB. 4.** Pr., current Red Cross Sr. Life Saving Certificate. American Red Cross Advanced Swimmer and Water Safety Instructor courses leading to certification.
370. **DANCE SURVEY (3). LEC. 2, LAB. 2.** Comprehensive study of dance from primitive man to current styles of dance.
372. **DANCE PRODUCTION (3). LEC. 2, LAB. 2.** Apprenticeship in producing dance programs, exhibitions of physical activity and festivals.
373. **DANCE THEATRE (1-6).** Pr., COI. Participation in rehearsal lecture demonstrations, concert work and other presentations related to dance.
386. **RECREATION LEADERSHIP (3).**
387. **OUTDOOR RECREATION (3).**
388. **CAMP MANAGEMENT (3).**
389. **RECREATION INTERPRETATIVE SERVICES (3).** Pr., HPR 282. Principles and techniques used to communicate natural, historical, and cultural features of an outdoor recreation area to park visitors. Develops the ability to gather information, create, and present an interpretative program.
394. **ELEMENTARY SCHOOL HEALTH INSTRUCTION (3). LEC. 2, LAB. 2**
395. **SECONDARY SCHOOL HEALTH INSTRUCTION (3). LEC. 2, LAB. 2.**
396. **DRUG USE AND ABUSE (3).** Investigation of stimulants and depressants with special emphasis on alcohol, narcotics, and tobacco. The effects of these substances on the human body and the social, economic, and community problems associated with their use.
404. **ATHLETIC INJURIES (3).**
405. **PHYSIOLOGY OF EXERCISE (4). LEC. 3, LAB. 2.** Pr., ZY 250-251. Principles of physiology with special emphasis on the application of physiological findings to practical problems related to human physical activity.
416. **ADAPTIVE PHYSICAL EDUCATION (3). LEC. 3, Spring. Pr., HPR 315, ZY 250-251.** Review of anatomy, physiology, and psychology pertaining to special programs of physical education for the temporarily and permanently handicapped, with laboratory practice in posture training and remedial gymnastics.
424. **INTRAMURALS AND OFFICIATING (3). LEC. 2, LAB. 2.**
429. **MOTOR LEARNING AND PERFORMANCE (4). LEC. 3, LAB. 2.** Pr., HPR 211 or 212. Process of motor skill acquisitions; emphasis on variables that influence motor learning and performance.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations normally in small groups.
485. **SOCIAL RECREATION (3).**
486. **PARK PLANNING (3).** Pr., HPR 282. Basic design principles as related to recreation and park planning. Consideration is given to design problems and solutions in park maintenance, vandalism, visitor control and other problems of recreation resource management.
487. **PARK MANAGEMENT (3).** Pr., HPR 282. An investigation into the operation of parks and resource areas with emphasis on the managerial function of the park administrative personnel.
494. **EMERGENCY CARE AND FIRST AID (3). LEC. 2, LAB. 2.**
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.
496. **PROBLEMS OF HEALTH EDUCATION AND HEALTH OBSERVATION OF SCHOOL CHILDREN (5).** Pr., junior standing. Helps the teacher with the details of health observation, aids in health guidance of individual pupils, acquaints the teacher with the health services available through local and state departments.

Professional Courses

102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfer from other curricula to understand teacher education and teaching as a profession.
414. **TEACHING IN HEALTH AND PHYSICAL EDUCATION IN ELEMENTARY AND SECONDARY SCHOOLS (3).** LEC. 2, LAB. 2. Pr., FED 320 or equivalent, and admission to Teacher Education. (For description, see Interdepartmental Education.)
423. **PROGRAM IN AREA OF SPECIALIZATION (3-5).** LEC. 2, LAB. 2. Pr., FED 320 or equivalent and admission to Teacher Education.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.

ADVANCED UNDERGRADUATE AND GRADUATE

509. **ADVANCED HEALTH SCIENCE (5).** Pr., COI. Principles and concepts basic to the improvement of individual and group living and the role of the home, school, and community in the development of sound physical and mental health.
517. **PHYSICAL EDUCATION FOR THE MENTALLY RETARDED (3).** LEC. 2, LAB. 2. The motor characteristics of the mentally retarded and the design of special programs of physical education; involves working with mentally retarded children.
519. **CURRENT PROBLEMS IN HEALTH EDUCATION (5).** Pr., COI.
520. **SOCIOLOGY OF SPORT (5).** Sport and culture. Attention is given to social processes and human behavior in sport situations.
572. **DANCE CONCEPTS AND RELATED CLASSROOM EXPERIENCES (5).**
580. **SCHOOL-COMMUNITY RECREATION (5).** Analysis of recreation as it relates to the school and the community.
597. **DRUG ABUSE EDUCATION (5).** Pr., COI. Designed to provide a practical and working understanding and means of response to drugs and drug abuse problems to prospective and in-service teachers, counselors, administrators, pharmacists, law enforcement personnel, nurses and other. Interdisciplinary team instruction is utilized.

GRADUATE

601. **HISTORY OF SPORT AND PHYSICAL EDUCATION (5).** Historical backgrounds of sport and physical education with emphasis on the development of significant trends and the contributions of specific individuals.
615. **BIOMECHANICS OF SPORT (5).** In-depth investigation of the mechanical and musculoskeletal factors that affect human performance in sport activities; methods of cinematographic, electromyographic and electronic assessment of human motor skills with emphasis on determination of effective and efficient movement patterns.
616. **BIOMECHANICS OF SPORT INJURY (5).** Analysis of musculoskeletal factors, pathomechanics, and tissue properties that define the tolerance of the human body to the forces and torques developed in sport activities. Techniques for prevention of injury and design of protective equipment based on such information are explored.
619. **SCIENTIFIC PRINCIPLES APPLIED TO PHYSICAL EDUCATION AND ATHLETICS (5).** Pr., undergraduate major or minor in health and physical education. Specific application of physics, physiology, and psychology to the development of physical skills and related topics including reaction time, motivation, maturation, illusions, morale, and problems of group social living in physical education and athletics.
625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods and evaluation and analysis of the intern experience.
626. **PHYSICAL FITNESS A CRITICAL ANALYSIS (5).** Pr., ZY 250-251 or consent of department head. A critical analysis of physical fitness objectives of physical education through inquiry into current research in medicine, physiology of muscular activity, and physical fitness appraisal and guidance.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN HEALTH, PHYSICAL EDUCATION, AND RECREATION (1-10).** Pr., graduate standing. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.

653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

655. **MOVEMENT EDUCATION (5).** Developing a theoretical understanding of perceptual motor development and movement education, and in exploring the interdisciplinary implications of movement education for child development and the teaching-learning process.
662. **PHYSICAL DIMENSIONS OF COUNSELING (5).** Pr. CED 621 or 622. The physical aspects of the helping relationship; implementation of physical fitness skills to raise the energy level of the helper; use of physical fitness and challenge response activities as a tool in the helping relationship. (This course is also offered as CED 662.)
669. **ADVANCED PHYSIOLOGY OF EXERCISE (5).** Pr. HPR 405 or equivalent. Physiological aspects of training, fatigue and physical fitness with special emphasis on the integration of organ systems in adapting to requirements of muscular exercise.
695. **PRACTICUM. (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Program Designators—When appropriate, certain sections of the above common offerings are identified by programs within the departments by the use of letter designations as noted below:

(A) Health Education (B) Physical Education, and (C) Recreation Administration.

History (HY)

Professors Flynt, *Head*, Belser, Harrison, Jones, Lewis, Maehl,
Newton, Owsley, Rea, Reid, and Williamson
Associate Professors Bond, Cronenberg, Eaves, and Reagan
Assistant Professors Fabel, Hall, Henson, Kicklighter, Olliff, and Pickering

101. **WORLD HISTORY (3).** A survey of world civilization from prehistory to 1400.
102. **WORLD HISTORY (3).** A survey of world civilization from 1400-1815.
103. **WORLD HISTORY (3).** A survey of world history from 1815 to the present.
201. **A HISTORY OF THE UNITED STATES TO 1865 (5).**
202. **A HISTORY OF THE UNITED STATES SINCE 1865 (5).**
204. **TECHNOLOGY AND CIVILIZATION I (3).** The interaction of technology and of human culture from prehistoric times to the industrial revolution.
205. **TECHNOLOGY AND CIVILIZATION II (3).** The interaction of technology and of human culture from the industrial revolution to the end of the nineteenth century.
206. **TECHNOLOGY AND CIVILIZATION III (3).** The interaction of technology and other aspects of human culture in the twentieth century.
300. **INTRODUCTION TO LATIN AMERICAN HISTORY (5).** Pr., sophomore standing. Latin American civilizations to the present with emphasis on the Colonial Period.
301. **INTRODUCTION TO FAR EASTERN HISTORY (5).** Pr., sophomore standing. The major cultural and institutional developments of the area.
306. **CONTEMPORARY HISTORY (3).** Recent events and their effect on the modern world.
308. **NAVAL HISTORY OF THE UNITED STATES (3).** The United States Navy from the American Revolution to the present including the evolution of naval technology and strategy and the role of the navy in defense, discovery, and diplomacy.
309. **MILITARY HISTORY OF THE UNITED STATES (3).** History of the United States military policy, strategy, and tactics, 1775 to the present (land warfare).
310. **GRECO-ROMAN HISTORY (5).** Pr., sophomore standing. The Classical or Hellenic Civilization from the Homeric Age to the reign of the Emperor Justinian.

311. **MEDIEVAL HISTORY (5).** Pr., sophomore standing. Europe from the fall of the Roman Empire to the Age of Discovery.
315. **AMERICAN BLACK HISTORY TO 1900 (5).** Pr., sophomore standing. Racial and cultural origins of the black, including African background, the slave trade, slavery in the New World, emergence of the free black, emancipation of the slaves, Reconstruction, and segregation.
322. **THE UNITED STATES IN WORLD AFFAIRS (3).** General elective. Pr., sophomore standing. The influence which the United States has exerted in international affairs.
350. **HISTORY OF POLITICAL PARTIES (5).** Pr., sophomore standing. Origin and growth of American political parties from the Federalist era to the present.
355. **HISTORY OF THE IBERIAN PENINSULA (5).** Spanish and Portuguese history from prehistoric to contemporary times.
360. **CULTURAL AND POLITICAL HISTORY OF ITALY SINCE 1400 (5).** A survey of Italian history since the Renaissance.
371. **HISTORY OF THE WEST (5).** Pr., sophomore standing. The development of the West and its influence on American history.
380. **SCIENCE FICTION AS INTELLECTUAL HISTORY (5).** Pr., junior standing. The interaction between science, technology, and other aspects of human culture as dramatized in classic works of science fiction written during selected historical eras.
381. **HISTORY OF ALABAMA (5).** Pr., sophomore standing. A brief history of Alabama from the beginning to the present.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **AMERICAN COLONIAL HISTORY (5).** The political, economic, and social history of the colonies from their founding to the end of the French and Indian War, 1763.
501. **THE AMERICAN REVOLUTION AND THE CONFEDERATION, 1763-1789 (5).** The new British Colonial policy, the War for Independence, and the first federal constitution and the movement to replace it.
502. **FEDERALIST AND JEFFERSONIAN AMERICA, 1789-1815 (5).** The establishment of the new federal government, the origins of American political parties, and the role of the United States in the French Revolutionary and Napoleonic Wars.
503. **THE AMERICAN SYSTEM AND JACKSONIAN DEMOCRACY, 1815-1850 (5).** Nationalism, sectionalism, egalitarianism, and expansion.
504. **THE CIVIL WAR (5).** The sectional controversy from the Compromise of 1850 to the beginning of hostilities in 1861, and the military, economic, social, and political aspects of the war.
505. **THE RECONSTRUCTION PERIOD (5).** An analysis of the social, economic, and political aspects of the years 1865-1877.
506. **UNITED STATES HISTORY, 1877-1914 (5).** The political, economic, diplomatic, social, and cultural development of the United States.
507. **RECENT UNITED STATES HISTORY, 1914-1932 (5).** Political, economic, and social development of the United States.
508. **MODERN AMERICA, 1932 TO THE PRESENT (5).** Political, economic, and social development of the United States.
509. **NINETEENTH-CENTURY U.S. DIPLOMACY (5).** U.S. relations with foreign powers during the 19th century.
510. **TWENTIETH-CENTURY UNITED STATES DIPLOMACY (5).** Emergence of America as a world power.
511. **SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES TO 1876 (5).** Selected areas of American thought ranging from Puritanism to the impact of Darwinism on the American mind.
512. **SOCIAL AND INTELLECTUAL HISTORY OF THE UNITED STATES SINCE 1876 (5).** Major intellectual movements in American society from social Darwinism to Progressivism and its legacy.
513. **THE SOUTH TO 1865 (5).** The origins and growth of distinctive social, economic, cultural, and ideological patterns in the South with emphasis on period 1815-1860.
514. **THE SOUTH SINCE 1865 (5).** Major trends in the South since the Civil War with emphasis on social, economic, cultural, and ideological development.
515. **AMERICAN BLACK HISTORY SINCE 1900 (5).** An analysis and interpretation of the role of American blacks in the development of the United States in the twentieth century.
516. **SOCIAL AND INTELLECTUAL HISTORY OF MODERN EUROPE (5).** Selected topics in social and intellectual history which have shaped modern European cultures.
517. **AMERICAN FOLK/ORAL HISTORY (5).** Pr., junior standing. A cultural survey of the "common people" utilizing oral history.
526. **THE RENAISSANCE AND REFORMATION, 1500-1600 (5).** Pr., Jr. standing. Europe during the Reformation and Renaissance.

527. **SEVENTEENTH-CENTURY EUROPE (5).** Emphasis on the Thirty Years' War, Scientific Revolution, overseas colonization, and European political developments in the age of Louis XIV.
528. **EUROPE, 1715-1789 (5).** A history of Europe from the Age of Absolutism to the collapse of the Old Regime.
529. **THE FRENCH REVOLUTION, 1789-1799 (5).** Background: causes and course of the Revolution in France.
532. **THE GENESIS OF MODERN GERMANY (5).** A survey of the political, constitutional, and cultural history of Germany to 1740.
533. **MODERN GERMAN HISTORY (5).** A general history of the German states since 1740.
535. **NAPOLEONIC EUROPE, 1799-1815 (5).** The rise and fall of the Consulate and the Empire in France and French hegemony in Europe.
536. **MODERN FRANCE (5).** From the *Ancien Regime* to the present.
543. **HISTORY OF EUROPE, 1815-1871 (5).** European history from the Congress of Vienna through the unification of Germany and Italy.
544. **EUROPE, 1871-1919 (5).** Emphasis on Central Europe, Germany, and Italy since unification.
545. **EUROPE SINCE 1919 (5).** Emphasis on the rise of totalitarianism, the Second World War, and the post-war period.
550. **EASTERN ASIA (5).** A history of China and Japan in the modern world.
551. **SOUTH AND SOUTHEAST ASIA (5).** The diverse cultures of the Asian periphery emphasizing the impact of the West in the recent period.
552. **THE CARIBBEAN AREA (5).** An analysis of the Caribbean as to its geographic, cultural, and strategic importance from 1492 to the present.
553. **SOUTH AMERICA TO 1900 (5).** The colonial and early national period.
554. **HISTORY OF MEXICO (5).** An analysis of the unique cultural development of Mexico.
555. **TWENTIETH-CENTURY SOUTH AMERICA (5).** A survey of the conflict between tradition and change in a developing continent.
556. **HISTORY OF MODERN RUSSIA, 1453-1917 (5).** A detailed history of the Russian nation in the modern era to the dissolution of the Empire.
557. **HISTORY OF THE SOVIET UNION SINCE 1917 (5).** The territories under the Bolshevik regime from the proclamation of the Bolshevik state to the present time.
571. **HISTORY OF MEDIEVAL ENGLAND (5).** A survey of English origins and institutions to the seventeenth century.
572. **HISTORY OF MODERN ENGLAND (5).** A survey of British history since the seventeenth century.
578. **TECHNOLOGY AND SOCIETY IN PRE-INDUSTRIAL TIMES (5).** The interplay between technology and human culture during selected periods of pre-industrial history.
579. **TECHNOLOGY AND SOCIETY IN THE INDUSTRIAL REVOLUTION (5).** Various approaches to the study of the interaction between technology, industry, and society in the United States and other countries during selected periods, normally in the late eighteenth and nineteenth centuries.

GRADUATE

600. **SEMINAR IN AMERICAN HISTORY, 1763-1800 (5).**
601. **SEMINAR IN AMERICAN HISTORY, 1800-1850 (5).**
602. **SEMINAR IN AMERICAN HISTORY, 1850-1876 (5).**
603. **SEMINAR IN AMERICAN HISTORY, 1876-1914 (5).**
604. **SEMINAR IN AMERICAN HISTORY, 1914- (5).**
605. **UNITED STATES FAR EASTERN DIPLOMACY (5).**
606. **UNITED STATES LATIN AMERICAN DIPLOMACY (5).**
607. **UNITED STATES ATLANTIC DIPLOMACY (5).**
608. **AMERICAN SOCIAL AND INTELLECTUAL HISTORY (5).**
609. **SEMINAR IN THE OLD SOUTH (5).**
610. **SEMINAR IN THE NEW SOUTH (5).**
611. **SEMINAR IN BLACK HISTORY (5).**
629. **HISTORICAL METHODS (5).**

- 632. SEMINAR IN MEDIEVAL HISTORY (5).
- 633. SEMINAR IN SIXTEENTH-CENTURY EUROPE (5).
- 634. THE REVOLUTION OF 1917-1921 (5). Pr., HY 556.
- 635. SEMINAR IN EUROPEAN HISTORY (5).
- 636. COLONIAL LATIN AMERICA (5).
- 637. LATIN AMERICA IN THE NATIONAL PERIOD, REVOLUTIONARY MOVEMENTS, AND NATIONAL DEVELOPMENTS (5).
- 638. SEMINAR IN THE FRENCH REVOLUTIONARY AND NAPOLEONIC ERA (5).
- 639. HISTORIOGRAPHY AND THEORY OF HISTORY (5).
- 640. TUDOR AND STUART ENGLAND (5).
- 641. EIGHTEENTH-CENTURY ENGLAND (5).
- 644. SEMINAR IN MODERN EUROPEAN DIPLOMACY (5).
- 650. ARCHIVAL INTERNSHIP (10). Pr., HY 628.
- 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)

READING COURSES

The following reading courses are offered in order to give the graduate student an opportunity for study in specialized areas and are rigorously supervised by the professors responsible for the fields. Registration is by permission of the department and the major professor.

- 620. DIRECTED READING IN AMERICAN HISTORY TO 1876 (5).
- 621. DIRECTED READING IN AMERICAN HISTORY SINCE 1876 (5).
- 622. DIRECTED READING IN AMERICAN DIPLOMACY (5).
- 623. DIRECTED READING IN AMERICAN SOCIAL AND INTELLECTUAL HISTORY (5).
- 624. DIRECTED READING IN LATIN AMERICAN HISTORY (5).
- 625. DIRECTED READING IN FAR EASTERN HISTORY (5).
- 626. DIRECTED READING IN ENGLISH HISTORY (5).
- 627. DIRECTED READING IN EUROPEAN HISTORY (5).
- 628. DIRECTED READING AND STUDY IN ARCHIVAL PROCEDURES (5).

Horticulture (HF)

Professors Perkins, *Head*, Amling, Chambliss, Norton, Orr, and Sanderson
Associate Professors Dozier, Perry, Ponder, and Rymal
Assistant Professors Robinson and Smith

LANDSCAPE AND ORNAMENTAL HORTICULTURE

- 101. INTRODUCTION TO HORTICULTURE (1). LEC. 1. Fall. An orientation course for freshman introducing all fields in Horticulture.
- 221. LANDSCAPE GARDENING (5). LEC. 3, LEC.-DEM. 4. Pr., BI 102. Principles of landscape gardening applied to the development of small home grounds and school grounds. The lecture-demonstration periods are devoted to the study of the identification and use of ornamental plants, landscape drawings, and the propagation and maintenance of ornamental plants.
- 222. TREES (5). LEC. 3, LAB. 4. Pr., HF 221 or COI. Identification, culture and use of ornamental trees in landscape plantings.
- 223. EVERGREEN SHRUBS AND VINES (5). LEC. 3, LAB. 4. Pr., HF 221 or COI. Identification, culture, and use of broadleaf and narrowleaf evergreens in landscape plantings.
- 224. PLANT PROPAGATION (5). LEC. 3, LAB. 4. Pr., BI 102. Basic principles and practices involved in the propagation of horticultural plants.

225. **FLOWER ARRANGING (3). LEC. 2, LAB. 2.** General elective. Principles and practices of flower arranging for the home.
226. **LANDSCAPE GRAPHICS (3). LEC. 2, LAB. 3.** The development of drawing and drafting skills used to evolve and communicate schematic and detail landscape design concepts.
321. **DECIDUOUS SHRUBS AND VINES (5). LEC. 3, LAB. 4. Pr.,** HF 221 or COI. Identification, culture and use of deciduous shrubs and small trees in landscape plantings.
323. **GREENHOUSE ENVIRONMENT CONTROL (5). LEC. 4, LAB. 3. Pr.,** BY 102, HF 224. Principles and practices of construction and utilizing greenhouses for various purposes such as plant propagation, crop production, and research.
324. **ELEMENTS AND PRINCIPLES OF LANDSCAPE DESIGN (5). LEC. 3, LAB. 4. Pr.,** HF 221 and at least 5 hours from the plant materials courses to be taken previously or concurrently, or COI. The art elements and design principles as they relate to Landscape Design. The organization of outdoor spaces leading to the evolution of Landscape Designs emphasized.
328. **LANDSCAPE CONSTRUCTION (5). LEC. 2, LAB. 6. Pr.,** HF 226, 324 or COI. Investigation of the principles and practices used in the detail design and implementation of a landscape site plan or landscape planting plan. Topics to be covered: drafting, surveying, properties of construction materials, earthwork, drainage, and specifications.
425. **FLOWER SHOP MANAGEMENT (5). LEC. 4, LAB. 3. Pr.,** HF 225, 522, MN 241, ACF 211, COI. Winter, even years. Principles and practices in the establishment and management of a retail flower shop. Store location, financing, buying, floral design, pricing, and merchandise control.
426. **MINOR PROBLEMS (3-5).** May be taken more than once for a total of 15 hours. Pr., COI. Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or green house investigations are made, under supervision of instructors.
427. **INTERMEDIATE LANDSCAPE DESIGN (5). LEC. 2, LAB. 6. Pr.,** HF 324 or COI. Man, nature, art and technology and their influence on Landscape Design.
428. **ADVANCED LANDSCAPE DESIGN (5). LEC. 2, LAB. 6. Pr.,** HF 328, 427, and at least 10 hours from the plant materials courses to be taken previously or concurrently, or COI. Continuation of HF 427.

ADVANCED UNDERGRADUATE AND GRADUATE

521. **CARE AND MAINTENANCE OF ORNAMENTAL PLANTS (5). LEC. 3, LAB. 4. Pr.,** BY 306, 309, Winter. Principles and practices of the care and maintenance of trees and shrubs, including pruning, tree surgery, transplanting, and fertilization.
522. **FLORICULTURAL CROP PRODUCTION (5). LEC. 4, LAB. 3. Pr.,** AY 304, BY 306, 309, HF 323, ZY 502 or COI. Floricultural crop production under management in greenhouse and outdoor conditions.
523. **NURSERY MANAGEMENT (5). LEC. 3, LAB. 4. Pr.,** HF 224, BY 306, AY 304, Winter. Principles and practices of the management of a commercial ornamental nursery.
531. **ADVANCED LANDSCAPE GARDENING (4). LEC. 3, LAB. 4. Pr.,** BI 101, HF 221, graduate standing. Principles and practices applying to the use of ornamental plant material in landscaping. (Selected portions of this course may be offered as a 3 hour credit in the Master of Agriculture program.)
532. **CONTROLLED PLANT GROWTH (5). LEC. 3, LAB. 4. Pr.,** AY 304, BY 306, CH 208, HF 323, junior standing. Controlling and directing growth of plants by manipulation of the environment and by the use of chemicals.

GENERAL HORTICULTURE

101. **INTRODUCTION TO HORTICULTURE (1). LEC. 1.** Fall. An orientation course for freshmen introducing all fields in Horticulture.
201. **ORCHARD MANAGEMENT (5). LEC. 3, LAB. 4.** Fall and Spring. Propagating, planting, pruning, cultivating, fertilizing, spraying, thinning, harvesting, grading, storing and marketing the most valuable fruits and nuts grown in the South.
308. **VEGETABLE CROPS (5). LEC. 3, LAB. 4.** Fall, Winter, Spring. Principles and special practices used in production of vegetable crops.
340. **INDUSTRIAL FOOD PRESERVATION TECHNOLOGY (5). LEC. 3, LAB. 4. Pr.,** COI or junior standing, Winter, odd years. Principles of food preservation as applied to industry. Processes considered include refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives.
426. **MINOR PROBLEMS (3-5).** May be taken more than once for a total of 15 hours. Pr., COI. Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
429. **FOOD SCIENCE SEMINAR (1). Pr.,** senior standing, Winter. Lectures, discussions and literature reviews by staff, students, and guest lecturers.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **COMMERCIAL VEGETABLE CROPS (5).** LEC. 3, LAB. 4. Pr., HF 308. Spring, odd years. Advanced course in production, storing, packaging, and marketing of the major commercial vegetable crops.
504. **FRUIT GROWING (4).** LEC. 3, LAB. 2. Pr., BI 102, HF 201, CH 207. Production and marketing of commercial tree fruits grown in the South.
505. **SMALL FRUITS (4).** LEC. 3, LAB. 2. Pr., BI 102. Spring, even years. Principles and practices involved in the production of strawberries, grapes, blueberries, and brambles.
506. **NUT CULTURE (4).** LEC. 3, LAB. 2. Pr., BI 102, CH 207, HF 201. Spring, odd years. Production and marketing of pecans, walnuts, and chestnuts.
543. **FOOD CHEMISTRY (5).** LEC. 3, LAB. 4. Pr., CH 207. Winter. The chemistry of the important components of foods and changes occurring during processing, storage and handling.
545. **FOOD ANALYSIS AND QUALITY CONTROL (5).** LEC. 3, LAB. 4. Pr., HF 543. Spring, even years. Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards.

GRADUATE

601. **EXPERIMENTAL METHODS IN HORTICULTURE (5).** LEC. 3, LAB. 6. Any quarter. Purposes of research, discovery, and progress as related to the scientific methods; research programs, horticultural programs, selecting projects, reviewing literature, preparing project outlines, conducting experiments, recording data, analyzing data, and publication of results.
602. **SEMINAR (1).** May be taken more than once for a maximum of three hours credit. Fall, Winter, Spring.
603. **SPECIAL PROBLEMS IN HORTICULTURE (3-5).** CREDIT TO BE ARRANGED. Pr., graduate standing. Any quarter. Selected problems in vegetable production, pomology, food technology, or ornamental horticulture.
604. **PLANT GROWTH AND DEVELOPMENT (5).** LEC. 4, LAB. 2. Pr., CH 207 or BY 306, and COI. Spring, even years. Morphological and physiological changes in horticulture plants as induced by growth regulators and their theoretical implications in the improvement of horticultural crops production.
605. **NUTRITIONAL REQUIREMENTS OF HORTICULTURAL PLANTS (5).** LEC. 4, LAB. 2. Pr., BY 306. Spring, odd years. Nutritional requirements of horticulture crops and factors affecting these requirements.
606. **PHYSIOLOGY OF HORTICULTURAL PRODUCTS FOLLOWING HARVEST (5).** LEC. 3, LAB. 4. Pr., BY 306, graduate standing. Summer, even years. Physiological changes occurring in fresh fruits, vegetables, and other horticultural plant products after harvest. Methods of studying these changes and factors influencing them.
607. **BREEDING OF HORTICULTURAL CROPS (5).** LEC. 3, LAB. 4. Pr., ZY 300, graduate standing. Summer, odd years. An application of genetic principles in the propagation and maintenance of fruit, vegetable, and ornamental crop varieties. The genetic basis of some production problems, and special breeding methods applicable to horticultural crops.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Industrial Design (IND)

Professors Pfeil and Schaar
Associate Professor Bullock, *Head*
Assistant Professor Downes

210. **INDUSTRIAL DESIGN (6).** LEC. 2, LAB. 12. Pr., sophomore standing. (2.00 overall). Visual communication. Perception theory, design fundamentals; color, figure organization, movement and balance, proportion and rhythm.
211. **INDUSTRIAL DESIGN (6).** LEC. 2, LAB. 12. Pr., IND 210 and COI. An extension of principles encountered in Industrial Design 210. A study and analysis of Industrial Design Fundamentals.
212. **INDUSTRIAL DESIGN (6).** LEC. 2, LAB. 12. Pr., IND 211 and COI. Structural and functional relationship of design elements; convenience, utility, safety, maintenance.
221. **MATERIALS & TECHNOLOGY (5).** LEC. 5. Pr., sophomore standing. The properties and use of various materials in manufacture and a study of the machine and tool processes used by industry. Survey from the Designer's viewpoint.
222. **TECHNICAL ILLUSTRATION (5).** LEC. 5. Pr., sophomore standing. Axonometric drawing, perspective, and freehand graphics, as used by Industrial Designers.
223. **INDUSTRIAL DESIGN METHODS (5).** LEC. 5. Pr., sophomore standing. The methods and organizational procedures employed in the analysis and solutions of design problems. Survey of philosophies and theories of design.
307. **ANTHROPOMETRY (5).** LEC. 5. Pr., IND 222, 223, 311, TS 105. Survey and Introduction to the field of body measurements and movements in relation to Design.

308. **DESIGN WORKSHOP (5). LEC. 3, LAB. 6.** Pr., IND 210, TS 111. Modelmaking and creative modeling. Study Models, Presentation Models, Mock-ups, Prototypes.
309. **DESIGN COMMUNICATION (5). LEC. 5.** Pr., IND 222. Experiments in visual thinking and modeling.
310. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 212, 221, 222, 223, TS 105. (2.00 overall and 2.33 from IND 210, 211, 212.) Packaging, trademark and corporate identity programs. Exhibition and display fixtures.
311. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 221, 310. Product design utilizing principles of design methodology from idea stages through working models.
312. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 311. Emphasis on concept development using drawing and rendering skills for idea communication and presentation.
410. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 312, 307, 308, 309. Industrialized building. Housing systems produced by industrial means.
411. **INDUSTRIAL DESIGN (6). LEC. 2, LAB. 12.** Pr., IND 410. (2.25 overall and 2.50 from IND 310, 311, 312, 410.) Design or re-design of products and systems of advanced complexity.
412. **INDUSTRIAL DESIGN THESIS (6). LEC. 2, LAB. 12.** Pr., IND 411. A project involving all design phases; project of the student's own selection and approved by the Committee on Design. Presentation of graphics, models and written explanations, and oral presentation before a Design Jury. The thesis material will be retained by the Department for one year.
415. **HISTORY OF INDUSTRIAL DESIGN I (5).** Pr., IND 212. Design from the first Industrial Revolution to the present, with emphasis on the relation between design and science, art, technology, and the humanities.

ADVANCED UNDERGRADUATE AND GRADUATE

516. **HISTORY OF INDUSTRIAL DESIGN II (5). LEC. 5.** Design from the beginning of artifacts to the first Industrial Revolution, with emphasis on the relation between design and sciences, art, technology, and the humanities.
585. **SEMINAR IN INDUSTRIAL DESIGN (5). LEC. 5.** Pr., 4th year standing. Development of individual projects. Research, design, reports, on approved topics. May be repeated for a maximum of ten hours upon approval of Committee on Design.
586. **CASE STUDIES IN DESIGN (5). LEC. 3, LAB. 6.** Design projects undertaken by industry will be studied by examination of artifacts and records, by interviews with professionals responsible for the phases of the projects, and by class discussions of this data and its implication. Focus on the socio-cultural relevancy of the artifacts.

GRADUATE

Individual courses available to graduate students in other fields.

- 601-602. **PRINCIPLES OF DESIGN (5-5). LEC. 2, LAB. 9.** The communication principles of form qualities, with emphasis of these principles to the technical and human factors of artifacts, and to the human visual environment.
605. **DESIGN MANAGEMENT (5). LEC. 3, LAB. 6.** The Industrial Design project management and development with emphasis on the interrelational management concepts of research, product planning, production and marketing.
606. **HUMAN FACTORS IN DESIGN (5). LEC. 3, LAB. 6.** A theoretical and empirical examination of human factors (anthropometrics, Biotechnology, Engineering Psychology, Behavioral Cybernetics, Ergonomics) as applied to man-machine environment systems.
- 608-609. **AESTHETICS IN DESIGN (5-5). LEC. 3, LAB. 6.** Aesthetics in the context of the designed environment encompassing such topics as: Non-verbal communication; object language and semiotics, gestalt and perception systems; information aesthetics and consumer product safety.
610. **DESIGN THEORIES (5). LEC. 3, LAB. 6.** An examination of Design Theories and Philosophies as related to technical artifacts in man-machine systems. Comparative studies of unifying theories in Art, Science, Design, Technology and the Humanities.
- 611-612. **DESIGN METHODOLOGY (5-5). LEC. 3, LAB. 6.** Industrial Design methodologies and scientific methods employed in research, analysis, synthesis and evaluation in comprehensive design problems. Emphasis on creativity and innovation.
- 613-614. **SYSTEMS DESIGN (5-5). LEC. 2, LAB. 6.** Systems approach and interdisciplinary team work to Design problems, inquiries into details of sub-systems, components, and parts, with emphasis on the relation of the performance of technical systems to optimal human factor effects.
- 620-621-622-623. **INDUSTRIAL DESIGN (5-5-5-5). LEC. 1, LAB. 12.** Synthesizing studies in research, analysis and application based on an interdisciplinary concept. The project content is according to the student's interest from one or several of the following design areas: Product Design, Industrialized Housing, Package Design, Corporate Communications, Transportation Design, Exhibition Design and Systems Implementation. Emphasis on the relation of products and systems to those who use them.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Industrial Engineering (IE)

Professors Brooks, Head, and Cox

Associate Professors Brown, Herring, Hool, Layfield, Maghsoudloo, Smith, Trucks,
Webster, and White

Assistant Professors Boyd, Goulet, and Higginbotham

202. **INDUSTRIAL ENGINEERING FUNDAMENTALS (3).** Introduction to the fundamentals of tools and techniques used in the practice of industrial engineering. The relationships of the sub-disciplines of industrial engineering to the current curriculum and typically encountered problems are explored. Introduction to computer programming and the FORTRAN programming language.
300. **COMPUTER PROGRAMMING AND INTRODUCTION TO INFORMATION-DECISION SYSTEMS (3). LEC. 2, LAB. 3.** Pr., an introductory knowledge of FORTRAN, MH 265 or concurrently. Intermediate computer programming using the FORTRAN programming language with emphasis on mathematical and engineering problems. Included are introductory design considerations for information-decision systems involving computers as a principle data processing device. (Intended primarily for engineering students and not open to students with credit in IE 204.)
301. **INFORMATION RETRIEVAL AND COMPUTER PROGRAMMING (3). LEC. 2, LAB. 3.** Pr., IE 202, or 204, or knowledge of a computer language. An introduction to digital computer programming with emphasis on information retrieval problems using COBOL programming language.
305. **INFORMATION-DECISION SYSTEMS (3). LEC. 2, LAB. 3.** Pr., IE 300. Interrelated components of complex management information-decision systems. Design considerations for systems involving computers as a principle data processing device.
308. **ERGONOMICS I (4). LEC. 3, LAB. 3.** The analysis and design of work places and methods through application of ergonomic and methods engineering principles.
311. **ENGINEERING STATISTICS I (3).** Pr., MH 264. Basic probability, random variables and distribution functions.
323. **ENGINEERING STATISTICS II (5).** Pr., IE 311. Distribution functions, tests of hypotheses, estimation, regression and correlation methods and introduction to analysis of variance.
327. **ENGINEERING ECONOMIC ANALYSIS (5). LEC. 4, LAB. 3.** Pr., MH 265, EC 200, or equivalent or concurrently. The development of principles required in engineering economy studies and other decision-making oriented courses. Topics include interest and interest formula derivations, economic decision criteria, capital budgeting, depreciation methods, tax considerations and cost accounting, economic analysis of the selection and replacement of structures, equipment, processes and methods, break-even analysis and learning curves.
333. **ENGINEERING STATISTICS III (4).** Pr., IE 323. Continuation of IE 323. Included are two-way analysis of variance, X^2 goodness-of-fit, and statistical quality control. Emphasis is on quality control.
335. **LINEAR PROGRAMMING (4).** Pr., MH 163. Introduction to linear programming with emphasis on model formulation and solution. Other topics include matrix algebra applied to systems of linear equations, computer solutions, and optimality analysis.
364. **DATA STRUCTURES (3).** Pr., IE 204 or equivalent. Basic concepts of data. Linear lists, strings, arrays, and orthogonal lists. Representation of trees and graphs. Storage structures, allocation, and collection. Multilinked structures. Symbol Tables and searching techniques. Sorting techniques, and generalized data management systems.
385. **COMPUTER PROGRAMMING SYSTEMS I (3).** Pr., IE 204 or 300. An introduction to the types, relationships, uses made of computer languages which are grouped under the general name of software, with emphasis on utilities, operating systems, and specialized programming languages.
402. **SYSTEMS ANALYSIS FOR OCCUPATIONAL SAFETY (3).** Pr., IE 311. Analysis of safety performance, attribution of cost, identification and analysis of accident potential. Fault-tree analysis. Systems safety and reliability.
408. **ERGONOMICS II (5). LEC. 4, LAB. 3.** Pr., IE 308, 323. The assessment of human work performance and the establishment of performance standards.
415. **OPERATIONS RESEARCH MODELS (5).** Pr., IE 300, 323, 335. An introduction to operations research and some operations research models. Topics include the concepts of systems design, analysis and optimization, network models, introductory dynamic programming, game theory, queueing theory and an introduction to inventory theory, decision theory or Markov Chains.
416. **SIMULATION (3).** Pr., IE 305, 323. Simulation procedures for solving complex systems analysis problems. Emphasis on random processes, model building, and construction of computer simulation models.
422. **PRODUCTION CONTROL FUNCTIONS I (4).** Pr., IE 327, 408 or concurrently. Functions of production control; forecasting; inventory analysis; scheduling; dispatching and progress control.
425. **PRODUCTION CONTROL FUNCTIONS II (3).** Pr., IE 422, 427 or concurrently. Functions of production control; production planning; line balancing; plant location; plant layout; manufacturing processes.
427. **OPERATIONS AND FACILITIES DESIGN I (3). LEC. 2, LAB. 3.** Pr., IE 327. Design principles and concepts of complex systems. (Should be taken the quarter immediately prior to the taking of IE 428.)

- 428. OPERATIONS AND FACILITIES DESIGN II (3).** LAB. 9. Pr., IE 417, 424, 427. The design of industrial, institutional, governmental and service operations and facilities. (Should be taken during student's final quarter.)
- 436. PLANT LOCATION (3).** Pr., IE 315, 327, 417. Factors and techniques pertinent to the economic location of industrial plants.
- 438. OCCUPATIONAL SAFETY AND HEALTH ENGINEERING (5).** Pr., COI or senior standing. Occupational safety and health problems with emphasis on the role of the industrial engineer in the elimination of physical and environmental hazards.
- 490-491-492. INDUSTRIAL ENGINEERING PROBLEMS (1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.

Courses Not Open to IE Majors

- 201. INDUSTRIAL ADMINISTRATION (3).** Pr., sophomore standing. The concepts, techniques, and functions of engineering management.
- 204. COMPUTER PROGRAMMING (3).** Pr., MH 151 or 161. Digital computer programming with emphasis on mathematical problems, using FORTRAN programming language. (Not open to students with credit in IE 300.)
- 220. APPLIED STATISTICS (5).** Pr., MH 161. Introduction to probability and statistical methods including descriptive statistics, probability and probability distributions, sampling, estimation, regression, time series, index numbers, ranking, and analysis of variance. Applications to administrative and production-service functions will be emphasized.
- 302. PRODUCTION CONTROL TECHNIQUES (3).** Pr., IE 201 or MN-310. Planning, scheduling, routing, and dispatching in manufacturing operations. Mechanisms for production control.
- 310. MOTION AND TIME STUDY (5).** LEC. 4, LAB. 3. Pr., IE 220 or EC 274. Principles and practices of methods engineering and time study.
- 316. ELECTRONIC DATA PROCESSING SYSTEMS DESIGN (4).** LEC. 3, LAB. 3. Pr., IE 204 or 300 or 301 or equivalent programming capability. Application of computer and associated data processing equipment to business and administrative and decision systems design.
- 320. ENGINEERING ECONOMY (5).** Pr., MH 161, junior standing. Practical engineering studies for the economic selection of structures, equipment, processes and methods. (Not open to students with credit in IE 327.)
- 330. DECISION ANALYSIS (5).** Pr., IE 220 or equivalent. A quantitative analysis of the decision-making process involving models of certainty, risk, and uncertainty with applications to marketing, production, and administration. (Not open to engineering students.)
- 410. ENGINEERING STATISTICS (5).** Pr., MH 264 or COI. Basic probability, random variables, discrete and continuous distributions, sampling distributions, hypothesis testing, estimation, regression and correlation, one-way analysis of variance, testing goodness of fit. (Not open to students with credit in IE 311.)
- 411. OPERATIONS RESEARCH (5).** Pr., MH 266, IE 410 or equivalent or concurrently. Model construction, linear programming, network models, dynamic models, stochastic models, queueing theory, decision theory and simulation. (Not open to students with credit in IE 415.)

ADVANCED UNDERGRADUATE AND GRADUATE COURSES

- 508. HUMAN FACTORS ENGINEERING (5).** Pr., PG 211 or 212 or COI. Human factors engineering in systems design including applied anthropometry, work place design, assessment of work, noise and heat stress; and equipment design. (Not open to students with credit in IE 408.)
- 515. SENSITIVITY ANALYSIS IN OPERATIONS RESEARCH MODELING (3).** Pr., IE 415, and 416 and 422 or the equivalent, or COI. An investigation of how an operations research model's decisions and returns change with respect to changes in model parameters and characteristics. Several types of models are considered, and examples are presented.
- 540. SAMPLING AND SURVEY TECHNIQUES (3).** Pr., IE 323. Theory and application of statistical sampling and survey methods, with emphasis on methods optimization.
- 541. APPLIED INDUSTRIAL ENGINEERING MATHEMATICS (3).** Pr., MH 265. Formulation and solution of differential and difference equations. Solution techniques will include analytical theory, Laplace and Z transforms and computer techniques. Introduction to state variables, matrix algebra and analysis.
- 542. ADVANCED LINEAR PROGRAMMING (3).** Pr., IE 335. Continuation of IE 335 with emphasis on theory. Revised simplex, dual simplex, parametric programming, decomposition, and applied problems.
- 543. INVENTORY CONTROL (3).** Lr., IE 333, 415, 422. Application of quantitative methods to the control of industrial inventories.
- 550. SEARCH METHODS FOR OPTIMIZATION (3).** Pr., MH 264 or COI and senior standing. Single and multivariate search techniques and strategies which are used in finding the optimum of discrete or continuous functions about which full knowledge is not available.

553. **DYNAMIC PROGRAMMING (3).** Pr., MH 264. The theory and methods of dynamic programming will be presented. Specific applications will be discussed.
555. **ADVANCED COMPUTER PROGRAMMING (3).** Pr., IE 204 or 300 or COI. Formal definition and presentation of numeric and nonnumeric problems with solutions in the programming language PL/1.
556. **INTERMEDIATE SIMULATION (3).** Pr., IE 416 or COI, junior standing. Intermediate simulation procedures including an in-depth study of SIMSCRIPT, a powerful simulation procedure, and exposure to modeling processes which are relatively inaccessible such as large scale computer operating systems.
558. **RELIABILITY ENGINEERING (3).** Pr., IE 333, 415. Reliability, maintenance, and replacement, with emphasis on quantitatively descriptive methods to be used for problem solving.
559. **OPERATIONAL CONTROL SYSTEM DESIGN (3).** Pr., IE 425. The design of operational planning and control systems. Integration of individual systems functions. Concept of total systems optimization.
560. **MATERIALS HANDLING SYSTEMS (3).** Pr., IE 415, 416. Quantitative analysis and design of material handling systems. Quantitative methods and case studies.
561. **ADVANCED FACILITIES DESIGN (3).** Pr., COI. Quantitative methods used to design production and service facilities are emphasized. Case studies.
564. **ERGONOMICS III (3).** Pr., IE 408 or COI, senior standing. The philosophy and techniques of man-machine systems design. Emphasis is placed on proper integration of man into production systems.
566. **INDUSTRIAL MAINTENANCE ENGINEERING (3).** Pr., IE 305, 422 or COI. Industrial maintenance and organization including planning and scheduling, motivation, inspection, preventive maintenance, replacement, data processing and relation to other areas.
570. **SCHEDULING: THEORY AND APPLICATIONS (3).** Pr., IE 411 or 415 or COI. Network based sequencing and scheduling problems. Numerous algorithms are presented for scheduling facilities to achieve one or more of several desirable objectives within precedence and resource constraints. Scheduling areas discussed include projects, assembly lines, flow shops and job shops.
571. **CONTINUOUS PROCESS CONTROL AND DYNAMICS (3).** Pr., IE 541. Continuous process dynamics and block diagram formulation. Conventional continuous process control and introduction to advanced control topics.
572. **ENGINEERING OF ORGANIZATION AND MANAGEMENT (3).** Pr., COI, senior standing. Organizational theory and concepts: the interaction between the individual and the organization.
575. **PROJECT MANAGEMENT (3).** Pr., IE 411 or 415 or COI. Project management and development with primary emphasis on use of operations research methods and cost analysis. Study of the applications of CPM, PERT, and GERT to project management.
580. **DATA PROCESSING FUNDAMENTALS (5).** Pr., COI. An introduction to business data processing methods and procedures, hardware (primarily electro-mechanical and electronic), and software. Introductory programming using the COBOL language emphasizing business applications. (Not for science and mathematics students.)
585. **COMPUTER PROGRAMMING SYSTEMS II (3).** Pr., IE 385. An introduction to machine-oriented programming systems for digital computers. Emphasis will be placed upon the Assemble Language/360 as well as macro systems and input-output control systems.
586. **INFORMATION ORGANIZATION AND RETRIEVAL (3).** Pr., IE 305, 385, and 301 or 555. The analysis of information content by statistical, syntactic, and logical methods. Search strategies, matching techniques, and file organization in practical retrieval systems. Evaluation of retrieval effectiveness.
587. **FORMAL THEORY OF COMPUTER LANGUAGES (3).** Pr., IE 301, 555, 585 or COI. Detailed mathematical models of programming languages; phrase structure languages, particularly context-free languages, and their syntactic analysis with application to translation. An introduction to the principles of compilers.
588. **FUNDAMENTAL ALGORITHMS (3).** Pr., IE 555, 585. An introduction and analysis of algorithms commonly used by computer scientists. Topics include generating functions, sub-routines, coroutines, linear lists, trees, and multilinked structures.

GRADUATE

616. **INDUSTRIAL DYNAMICS (3).** Pr., IE 416 or COI. Industrial dynamics based on a systems approach to industrial and related problems, with emphasis on decision-making.
617. **ADVANCED SIMULATION PROBLEMS (3).** Pr., IE 416 or COI. Journal readings of applications simulation and development of procedure to solve large scale, realistic simulation problems.
620. **ADVANCED ENGINEERING ECONOMY (3).** Pr., IE 327 or COI. Engineering and economic aspects of project design and analysis. Advanced treatment is given to the following topics: capital budgeting, financing manufacturing organizations, risk and sensitivity analysis, mathematical programming approach to investment decisions, and forecasting methods including input-output analysis.
621. **QUEUEING THEORY (3).** Pr., IE 323 or 410, MH 265, or COI. Mathematical models of queueing, with applications to problems such as materials flow, inventory policy, and service center design. Simulation solutions to queueing networks are considered.
622. **MARKOV CHAINS (3).** Pr., IE 415. Finite and continuous Markov Chains, Poisson and Wiener processes, applications will be discussed.

623. **TIME SERIES (3).** Pr., IE 415. Stationary stochastic processes, time series analysis with emphasis on spectral density functions and applications will be discussed.
624. **INVENTORY AND PRODUCTION CONTROL SYSTEMS (3).** Pr., IE 425. Advanced topics in production control and inventory theory. The relationships between production and inventory will be discussed.
625. **ADVANCED SCHEDULING THEORY (3).** Pr., IE 570. A survey of models and methodologies in the areas of sequencing and scheduling are presented. Models covered include: the single processor model, parallel processor model, flow shops and job shops. Methodologies covered include: integer and dynamic programming, branch and bound and other enumeration procedures as well as simulation and sampling and search methods.
630. **ADVANCED STATISTICAL METHODS FOR ENGINEERS I (3).** Pr., IE 323 or equivalent. Basic concepts of statistical experimental design including randomization methods, analysis of variance methods, mathematical derivation of expected mean squares multiple comparison tests, and the Bennett and Franklin algorithm.
631. **ADVANCED STATISTICAL METHODS FOR ENGINEERS II (3).** Pr., IE 630 or COI. Extension of IE 630, with primary emphasis on analysis of variance methods.
632. **ADVANCED STATISTICAL METHODS FOR ENGINEERS III (3).** Pr., IE 630 or COI. Elaboration of basic statistical methods for engineers, with emphasis on a more theoretical study of multiple linear regression and the optimization of multiple linear regression methods.
634. **NON-LINEAR PROGRAMMING (3).** Pr., IE 542. This course covers quadratic programming, separable programming, gradient methods, and integer programming.
640. **NONPARAMETRIC STATISTICS (3).** Pr., IE 323. The theory and application of several nonparametric and distribution-free statistical methods with emphasis on engineering applications.
642. **INPUT-OUTPUT ANALYSIS (3).** Pr., IE 542 or COI. Input-Output analysis for interindustry, industry, and company study. Computational aspects of large scale models. Case studies.
644. **OPTIMIZATION THEORY FOR LARGE SYSTEMS (3).** Pr., IE 634 or COI. Large problems with special structures: decomposition principle, many column problems, relaxation procedures, in linear programming, generalized upper bounding, partitioning procedures, and applications.
653. **ADVANCED DYNAMIC PROGRAMMING (3).** Pr., IE 553. Advanced topics in the theory and application of dynamic programming. Numerical methods to solve specific types of problems. Case studies.
661. **QUEUEING APPLICATIONS (3).** Pr., IE 621 or COI. Computer-communication networks based upon queueing theory.
663. **DECISION AND GAME THEORY (3).** Pr., IE 323 or 410 or COI. Classification of decision problems, Bayes risk, utility theory and its applications, optimal strategies for rectangular games, and use of linear programming in solving zero-sum games.
664. **MANAGEMENT INFORMATION DECISION SYSTEMS (3).** Pr., COI. Analysis of organizations for information requirements, information flow, data storage and usage and total information systems.
665. **ADVANCED TOPICS IN HUMAN ENGINEERING (3).** Pr., IE 564. Human information processing with particular emphasis on human decision behavior.
670. **ADVANCED COMPUTATION METHODS (3).** Pr., COI. Advanced computer languages, pattern recognition, and hybrid computation. This course is designed to keep the graduate student abreast of current ideas in this rapidly expanding field.
671. **DISCRETE PROCESS CONTROL AND DYNAMICS (3).** Pr., IE 571. Sampled-data control systems and computer control topics. Representation of discrete industrial processes.
672. **FUNCTIONAL OPTIMIZATION THEORY (3).** Pr., IE 415. Introduction to functional optimization theory including min-max theory, calculus of variations, pontryagin, maximum principles and applied functional analysis.
675. **ADVANCED OPERATING SYSTEMS DESIGN (3).** Pr., IE 301, 555, 585, or COI. Advanced software design methodology with applications focusing on computer operating systems.
676. **TELEPROCESSING SYSTEMS SOFTWARE (3).** Pr., IE 621. An introduction to the theory and methods used in developing telecommunication systems software.
680. **ADVANCED TOPICS IN OCCUPATIONAL SAFETY AND HEALTH (3).** Pr., IE 438 or equivalent. Coreq., IE 631 and 665, or COI. Selected topics including accident proneness, risk taking, and systems safety are pursued at the advanced level. Quantification and modeling are emphasized.
687. **FORMAL THEORY OF COMPUTER LANGUAGES II (3).** Pr., IE 587 or COI. An in-depth study of compiler principles including symbol tables, source and object program optimization, semantic analysis, storage organization, and code generation.
688. **METHODS OF SORTING AND SEARCHING (3).** Pr., IE 588 or COI. An introduction to the theoretical and practical aspects of searching and sorting via the digital computer. Study of algorithms necessary to create and optimize a sort or search routine.
- 690-691-692. **INDUSTRIAL ENGINEERING PROJECTS (1-5).** Pr., COI and department head approval. Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.

696. **SEMINAR (1).** Pr., IE Graduate Student Standing. Presentation and discussion of current I.E. research activities by students, faculty, and guests.
698. **M.I.E. DESIGN PROJECT. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.** May be taken more than one quarter.

Interdepartmental Education (IED)

Included in this section are program areas and course listings designed and taught on the interdepartmental basis. The subheadings reflect the nature and scope of the offerings.

101. **CAREER EXPLORATION AND PLANNING (1).** LEC. 1. Helps undeclared freshmen in planning their professional careers.

Curriculum and Teaching—Elementary-Secondary Teaching, Program, and Internship

Students in either secondary or elementary education pursuing a curriculum leading to K-12 certification for teaching in a particular field in elementary and secondary schools will take the Teaching and the Program courses in the teaching field in which certification is expected.

414. **TEACHING IN ELEMENTARY AND SECONDARY SCHOOLS (3).** LEC. 2, LAB. 2. Pr., FED 320 or equivalent. Admission to Teacher Education. (A) Art, (C) Dramatic Arts, (J) Music, (M) Speech Communication, (N) Speech Pathology.
423. **PROGRAM IN ELEMENTARY AND SECONDARY SCHOOLS (3).** LEC. 2, LAB. 2. Pr., FED 320 or equivalent. Admission to Teacher Education. (A) Art, (C) Dramatic Arts, (J) Music, (M) Speech Communication.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.

GRADUATE

648. **ADVANCED STUDY OF CURRICULUM AND TEACHING (5).** Pr., FED 647 or COI. Major issues, frontier developments, and trends in the improvement of curriculum and teaching in elementary and secondary schools.
658. **SEMINAR AND INDEPENDENT STUDY IN CURRICULUM AND TEACHING (5).** Pr., FED 647 and IED 648 or COI. Research and experimentation in elementary and secondary schools in the development of education programs and the improvement of teaching and learning. Appraisal of significant curriculum research, exploration of areas of needed research in curriculum and instruction, and study of fundamental criteria and methods for solving curriculum problems.

Community Education

GRADUATE

614. **IMPLEMENTING COMMUNITY EDUCATION CONCEPTS (5).** Integrating education within local institutions and socio-cultural movements. A review of strategies for implementing lifelong education services and for promoting a sense of community.

Alternative Residence

750. **ALTERNATIVE RESIDENCE SEMINAR (2-2-2).** Required of students in an alternative residence plan. These students must complete this three quarter sequence during the fall, winter, and spring quarters. Credit does not count toward minimum requirements for the Doctor of Education degree.

Music and Speech Education

GRADUATE

Each of the following courses may be taken as: (E) Gifted, (J) Music, and (M) Speech Communication.

625. **INTERNSHIP (5-15).** Provides advanced students with supervised, on the job experiences in a school or college or other appropriate setting. These experiences will be accompanied by regularly scheduled on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.

- 646. **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
- 650. **SEMINAR IN AREAS OF SPECIALIZATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
- 651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

Professional Writing

- 517. **PROFESSIONAL WRITING IN EDUCATION (2).** Fundamentals of education discourse; strategies and techniques in educational writing; reference sources; the preparation of manuscripts for publication in professional journals.

GRADUATE

- 605. **PRACTICUM IN EDUCATIONAL ASSESSMENT AND PRESCRIPTIVE REPORT WRITING (5).**

Journalism (JM)

Professors Simms, Head, Burnett, and Davis
Associate Professor Logue
Assistant Professor Morgan
Instructor Housef

Freshman English is prerequisite for all journalism courses except JM 101.

- 101. **NEWSPAPER STYLE (3).** Required for all journalism majors and minors. The AP-UPI Stylebook and common errors in word selection in newspaper writing.
- 204. **INTRODUCTION TO PUBLIC RELATIONS (5).** Introduction to broad spectrum of the field of public relations. The various communication skills and technologies necessary for successful public relations will be identified and explored. Credit for this course precludes credit for SC 204.
- 221. **BEGINNING NEWSWRITING (5).** Pr., JM 101; reasonable typewriting skills. Introduction to newswriting, newspaper style, and mechanical practice.
- 313. **REPORTING (5).** Pr., JM 221; reasonable typewriting skills. The technical aspects of reporting and newsgathering methods, supplemented by work on the college newspaper.
- 314. **COPYREADING AND EDITING (3).** Pr., JM 221. Methods of editing copy, writing headlines and proof reading.
- 315. **TECHNICAL JOURNALISM (3).** Not to be used for a major or minor in Journalism. Designed for students in agriculture and home economics. Introduces practices of news coverage and writing, with major emphasis on specialized fields of study.
- 321. **NEWSPAPER MAKEUP AND LAYOUT (5).** Pr., JM 221. Typography and design with practice applications in putting together newspaper pages.
- 322. **FEATURE WRITING (5).** Pr., JM 221 or COI. Gathering material for the writing of "human interest" and feature articles for newspapers and magazines, with consideration given to the marketing of manuscripts.
- 323. **THE COMMUNITY NEWSPAPER (5).** Pr., JM 221 and 321. Methods, problems, and policies involved in editing the community newspaper, as differing from the metropolitan daily.
- 355. **REPORTING OF POLITICAL AFFAIRS (3).** Pr., PO 210. Instruction and news assignments in political affairs. Credit in PO 355 precludes credit in JM 355.

421. **PHOTO-JOURNALISM (5).** Uses and processes of photography in the newspaper and magazine field. Operation of press cameras and the technique of developing, printing, and enlarging of pictures is provided.
- 422-423. **JOURNALISM WORKSHOP (3-3).** Pr., JM 313, 314, 321, 322, COI. A two-quarter course giving practical experience in preparation of newspaper, radio, television, and magazine copy through supervised work with University communication media. The student is expected to work 10 hours per week.
425. **JOURNALISM INTERNSHIP (6).** Pr., JM 313, 314, 321, 322, COI. A full-time internship of at least ten weeks with an approved publication, serving as a regular staff member under the direction of the editor.
435. **MAGAZINE EDITING AND PRODUCTION (5).** Pr., JM 221. Methods and problems of publishing the popular and trade magazine.
465. **THE HISTORY AND PRINCIPLES OF JOURNALISM (5).** The development of the American Press, the principles and ideals of modern journalism, and the law of the press and radio.
475. **JOURNALISM SPECIAL STUDIES (1-5).** Pr., Departmental approval. Research and analysis of specific problems of individual newspapers and wire services under faculty direction. Or, lectures and seminars by visiting professional journalists.
485. **ADVANCED REPORTING (3).** Pr., JM 313, 314, 321, 322, COI. Developing and writing news stories under deadline pressure; investigative and interpretive reporting.
504. **PUBLIC RELATIONS CASE STUDIES AND PROBLEM SOLVING (5).** Pr., JM 204 or SC 204 or COI. Investigation and analysis of public relations problems through case studies, and an application of necessary skills and techniques in solving public relations problems. Credit for this course precludes credit for SC 504.

Laboratory Technology (LT)

Associate Professor Wheatley

Adjunct Associate Clinical Professors H. C. Elliott and C. B. Elliot

Assistant Professor Kohl

Adjunct Assistant Clinical Professors Pollard and Roberts

101. **ORIENTATION (1).** Fall, Winter. Aims, objectives, and requirements for careers in Medical and Laboratory Technology.
301. **HEMATOLOGY (5).** LEC. 3, LAB. 6. Study, procedures, and examinations of the blood, as recommended by the American Society of Clinical Pathologists.
401. **ADVANCED HEMATOLOGY (5).** LEC. 3, LAB. 6. Pr., LT 301. Advanced study of blood cells and blood dyscrasias.
404. **IMMUNOLOGY I (5).** LEC. 3, LAB. 4. Pr., BY 302, junior standing. Theory of immunology and techniques of laboratory tests based on the antigen-antibody reaction.
405. **IMMUNOLOGY II (5).** LEC. 3, LAB. 6. Pr., LT 404, junior standing. Theory and techniques of the serological study of human blood and lipid antigens.
422. **HOSPITAL LABORATORY PRACTICE (5).** LAB. 15. Pr., LT 301. Practice applications of the principles, procedures, and techniques encountered in hospital laboratories.
525. **CLINICAL LABORATORY INSTRUMENTATION (5).** LEC. 3, LAB. 6. Pr., CH 519 or 508 or COI. Theoretical and practical application of continuous flow analysis, atomic absorption spectrophotometry, radioimmunoassay and chromatographic techniques used in the analysis of body fluids.

Law Enforcement (LE)

Assistant Professors Kelly and Pendergast

Adjunct Assistant Professor G. H. Wright

260. **SURVEY OF LAW ENFORCEMENT (5).** Pr., sophomore standing. Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation. Credit for this course precludes credit for PO 260.
261. **CRIMINAL EVIDENCE (3).** Comprehensive analysis of the rules of evidence with particular emphasis on evidence obtained through search, seizure, and arrest.
262. **CRIMINAL INVESTIGATION (5).** Pr., sophomore standing. Criminal investigation procedures, including theory of investigation, case preparation, specific techniques for selected offenses, questioning of suspects and witnesses, and problems in criminal investigation.
270. **CAREER EXPLORATION AND PLANNING (2).** Pr., LE/PO 260 and COI. Career opportunities and demands. Offered during period prior to Fall and Winter Quarters.
335. **CRIMINAL LAW FOR POLICE OFFICERS (3).** Pr., PO 209, 210, or LE/PO 260. Statutory criminal law and criminal court procedures as applicable to the law enforcement function. Considers the impact of statutory law and common law on police procedures and policies. Judicial interpretation of criminal statutes and its relation to police policies are discussed and an analysis is presented of common police procedures, investigative techniques, and functions in the light of criminal statutes.

361. **SURVEY OF CRIMINALISTICS (5).** Pr., LE 262, junior standing. Survey of scientific crime detection methods; crime scene search, identification and preservation of evidence; lie detection; *modus operandi*; fingerprint identification, and related subjects.
363. **POLICE ADMINISTRATION AND ORGANIZATION (5).** Pr., junior standing. Principles of organization and administration in law enforcement; functions and activities; planning and research; community relations; personnel and training; inspection and control; policy formulation.
461. **SEMINAR IN POLICE PROBLEMS (5).** Pr., LE 363 or 464.
464. **INTERNSHIP IN CRIMINAL JUSTICE (5-10).** Pr., consent of department head and junior standing. Internship in an approved law enforcement or correctional agency under supervision of the agency concerned. Written reports on internship required.

Management (MN)

Professors Henry, *Head*, Alexander, Allen, and Simon
Associate Professors Bedeian, Feild, Holley, Ledbetter, and Snow
Assistant Professors Adams, Berry, Cox, Giles, Jesse, Mossholder, Niebuhr, Norris,
Pipkin, Schell, Smith, Snyder, and Stanford

207. **INTRODUCTION TO COMPUTER PROGRAMMING (2).** Pr., 10 hours math, sophomore standing. Introduction to the use of the computer as a tool in solving business problems, using an appropriate programming language in both a time shared and batch processing environment.
274. **BUSINESS AND ECONOMIC STATISTICS I (5).** Pr., MH 151 or equivalent and EC 200 or AEC 202. Frequency distribution and time series analysis, index numbers; probability; binomial and normal distributions; introduction to statistical inference.
307. **BUSINESS COMPUTER APPLICATIONS (3).** Pr., MN 207. Computerizing business applications using a current business language.
308. **BUSINESS DATA FILE STRUCTURES (3).** Pr., MN 207. Data base management techniques, file management techniques, and data structures.
310. **PRINCIPLES OF MANAGEMENT (3).** Pr., junior standing. Management functions and the application of management principles in organizations.
346. **ORGANIZATION BEHAVIOR (4).** Pr., MN 310 and junior standing. Human relations as applied to business organizations.
375. **NONPARAMETRIC STATISTICS (3).** Pr., MN 274. The analysis of business and economic data by distribution-free statistical methods.
380. **PRINCIPLES OF OPERATIONS MANAGEMENT (3).** Pr., MN 310, junior standing. Modern scientific management as applied in the actual control and operation of industrial enterprises.
381. **MANAGEMENT DECISION MAKING (5).** Pr., MN 274, MN 207, 310 and 10 hours of mathematics, junior standing. Various quantitative techniques as aids in managerial decision making under conditions of imperfect knowledge.
382. **MANAGEMENT INFORMATION SYSTEMS (4).** Pr., MN 207, 310, and 380. Analysis and application of information flow in the business firm.
385. **PRODUCTION MANAGEMENT (5).** Pr., MN 380 and junior standing. Application of management procedures and techniques to analyze and control product production methods and processes.
386. **MATERIALS MANAGEMENT (3).** Pr., MN 380 and junior standing. Application of management procedures and techniques to the acquisition, utilization, and distribution of materials in product manufacturing.
410. **INTERNATIONAL BUSINESS MANAGEMENT (5).** Pr., EC 200, 202, MN 310, MT 331, ACF 361 and junior standing. Management of multinational firm which owns subsidiaries in several countries.
415. **SMALL BUSINESS MANAGEMENT (5).** Pr., MN 310, COI and senior standing. Problems and opportunities of small business management.
420. **APPLIED BUSINESS MANAGEMENT (5).** Pr., MN 310 and junior standing. Application of management principles to develop pragmatic solutions for management problems selected from actual business situations.
440. **ORGANIZATION THEORY (5).** Pr., MN 346 and junior standing. Organization theory and principles in the management of business operations.
442. **PERSONNEL MANAGEMENT (5).** Pr., MN 310 and junior standing. Management of labor, dealing with selection, training, placement, turnover, payment policies, employee representation, etc.
447. **EMPLOYEE COMPENSATION (3).** Pr., MN 442 and junior standing. Factors, philosophy, design, and problems of administration in compensation program.
480. **BUSINESS POLICIES AND ADMINISTRATION (5).** Pr., EC 200, 202, ACF 211, 212, 361, MN 274, 310, MT 255, 331 and senior standing. Formulation and application of policies and programs pertaining to personnel, production, finance, procurement, and sales in the business enterprise.

484. **OPERATIONS MANAGEMENT (5).** Pr., MN 380, 381, 382, 385, and 386. Capstone course for INM students. Application of material presented.
490. **SPECIAL PROBLEMS (1-10).** Pr., COI and junior standing. May be repeated. Investigation and research into problems with special interest for the student.
496. **READINGS IN MANAGEMENT (5).** Pr., MN 310 and junior standing. Readings from prominent periodicals and journals in management theories, practices, and functions.

ADVANCED UNDERGRADUATE AND GRADUATE

541. **ORGANIZATIONAL DEVELOPMENT (3).** Pr., MN 346 and junior standing. Methods used to bring about change in an organization.
545. **PERSONNEL AND ORGANIZATIONAL RESEARCH (3).** Pr., MN 346, MN 274 or PG 215 or equivalent, MN 442, and junior standing. Reading, analyzing, and conducting limited research studies in personnel and organizational problems.
550. **PERSONNEL SELECTION AND PLACEMENT (3).** Pr., MN 274 or PG 215 or equivalent, MN 442, and junior standing. Factors involved in developing an effective system for selecting, classifying, and placing personnel.
551. **MANPOWER PLANNING, DEVELOPMENT, AND APPRAISAL (3).** Pr., MN 442 and junior standing. Theory and practice plus design of managerial systems in these specialties.
574. **BUSINESS AND ECONOMIC STATISTICS II (5).** Pr., MN 274 or equivalent and junior standing. Probability distributions including the Poisson and "t" distributions, advanced time series analysis; chi square; multiple and partial correlation; statistical decision theory.
575. **QUANTITATIVE METHODS OF ECONOMICS AND BUSINESS (5).** Pr., MN 274 and junior standing. Quantitative methods and their application in production and distribution problems of business.

GRADUATE

510. **THE PROCESS OF MANAGEMENT (5).** Pr., consent of Director of Graduate Studies, School of Business. Accelerated course in management concepts, production functions and practices.
570. **FOUNDATIONS OF STATISTICS (4).** Pr., consent of the Director of Graduate Studies, School of Business. An accelerated course designed to provide beginning MBA students with a foundation in statistical concepts, techniques and applications.
581. **DATA PROCESSING AND INFORMATION SYSTEMS (3).** Pr., consent of Director of Graduate Studies, School of Business. Accelerated course in computer programming, data processing, and information systems.
600. **COMPUTERS AND INFORMATION SYSTEMS IN MANAGEMENT (5).** Pr., MN 510, 581 or equivalent or COI. In-depth analysis of computing, data processing, information systems in complex organizations.
605. **BEHAVIOR IN ORGANIZATIONS (5).** Pr., MN 510 or equivalent. Advanced study of human relations in individual and group interactions within the environment of business organizations. Emphasis on research literature in the field.
606. **MANAGEMENT PROBLEMS (5).** Pr., ACF 610, 663, EC 656, MN 605, 681 and MT 650. Basic administrative problems in business and industry. Managerial controls as applied to administrative and operative functions.
607. **MANAGERIAL ECONOMICS (5).** Pr., completion of prerequisites for graduate study in Business or COI. Decision theory and criteria for decision-making concerning output, pricing, capital budgeting, scale of operations, investment and inventory control. Attention is also given to concepts of profits, production and cost functions.
608. **HUMAN RESOURCE MANAGEMENT (5).** Pr., MN 442 or COI. Advanced personnel and human resource management.
610. **MULTINATIONAL BUSINESS MANAGEMENT (5).** Pr., completion of prerequisites for graduate study in Business. Management of the multinational enterprise which engages in direct foreign investment.
640. **ADVANCED ORGANIZATION THEORY (5).** Pr., MN 510. Traditional and contemporary organization theories with emphasis on current research and controversy.
649. **OPERATIONS MANAGEMENT (5).** Pr., MN 510 and MN 581. Detailed study of techniques related to capital investments, design and implementation of operating systems and management of production and inventory systems.
650. **SEMINAR (1-10).** Pr., MN 510, 581 and COI. For those students engaged in intensive study and analysis of management problems.
681. **DETERMINISTIC QUANTITATIVE METHODS (3).** Pr., MN 581 or equivalent. (Same as ACF 681.) Deterministic quantitative methods for business applications.
682. **STOCHASTIC QUANTITATIVE METHODS (3).** Pr., MN 581 or equivalent. (Same as ACF 682.) Various quantitative methods applied to management decision-making under conditions of risk and uncertainty.

690. **SPECIAL PROBLEMS (1-5).** Pr., MN 510, 581 or equivalent, completion of 10 hours of 600-level management courses, and COI. Variable content in the management area.
696. **READINGS IN MANAGEMENT (5).** Pr., MN 510. General management theories, practices, and functions in industry and business. Also, covers the role of personnel management and human relations.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Pr., COI.

Industrial Relations

ADVANCED UNDERGRADUATE AND GRADUATE

500. **INDUSTRIAL RELATIONS (5).** Pr., EC 200 and junior standing. General survey of the development of collective bargaining, major provisions of labor law, and bargaining issues of craft and industrial unions.
501. **LABOR RELATIONS LAW (5).** Pr., EC 350 or MN 500 and junior standing. Analysis of background, content, and significance of industrial relations law.
502. **LABOR-MANAGEMENT NEGOTIATION (3).** Pr., MN 500 or MN 501 and junior standing. Bargaining issues, preparation for contract negotiation, and simulated bargaining sessions.
503. **LABOR ARBITRATION (3).** Pr., MN 500 or MN 501 and junior standing. Interest and grievance arbitration of Labor-Management issues. Case studies emphasized.
517. **LABOR RELATIONS IN PUBLIC ORGANIZATIONS (3).** Pr., junior standing. The background, legal and constitutional aspects and management of group negotiations and collective bargaining in public employment. (Same as PO 517.)
546. **PERSONNEL ADMINISTRATION LEGISLATION (3).** Pr., MN 442 and junior standing. Legal aspects of personnel administration activities.
554. **MULTI-NATIONAL NEGOTIATION AND INTERNATIONAL LABOR (3).** Pr., MN 500 or MN 501 or MN 410 and junior standing. Variations among nations in the structure and government of trade unions, their political and religious ties, and other factors that influence multi-national bargaining. Emphasis on industrialized nations.

GRADUATE

644. **COLLECTIVE BARGAINING AND ARBITRATION (5).** Pr., MN 500 or AED 693 or COI. The evolution and development of union-management relationships and the process of collective bargaining and arbitration.

Marketing and Transportation (MT)

Professors Baker, Head, Horton, and Lambert

Associate Professors Adams and Henley

Assistant Professors Cummings, Daley, Guffey, Harris, and Laumer

Legal Environment

241. **BUSINESS LAW I (4).** Pr., sophomore standing. Introduction to law, torts, contracts, agency and personal property.
242. **BUSINESS LAW II (4).** Pr., MT 241. Legal principles concerning real property, sales, negotiable instruments, partnerships, and corporations.
255. **LEGAL AND SOCIAL ENVIRONMENT OF BUSINESS (4).** Legal and social environment for business operation with emphasis on contemporary issues.
344. **ENVIRONMENTAL LAW (4).** Pr., junior standing. Federal, State, and local law on conservation and regulation of environmental matters.

GRADUATE

605. **SOCIAL AND LEGAL ENVIRONMENT OF BUSINESS (3).** Pr., EC 501. The influence of the social, legal, political and economic environment of business.

Marketing

331. **PRINCIPLES OF MARKETING (5).** Pr., EC 202 and junior standing. A general survey of the field of marketing covering marketing channels, functions, methods and institutions.
336. **QUANTITATIVE ANALYSIS IN MARKETING (5).** Pr., MN 207, 274, MT 331, MH 151, 161 and junior standing. An examination of the role of quantitative methods in implementing marketing strategy.
337. **FUNDAMENTALS OF SALESMANSHIP (5).** Pr., MT 331, 341 and junior standing. Knowledge and skill requirements for successful selling; the sales process; business and social responsibilities of salesmen.

341. **CONSUMER BEHAVIOR (5).** Pr., MT 331, PG 211, SY 201 and junior standing. Analysis of the consumer buying process as it is affected by environmental and institutional forces and development of market strategies which recognize these factors.
432. **PROMOTIONAL STRATEGY (5).** Pr., MT 331, 336, 341, and junior standing. Problems of persuasive marketing strategy, promotional objectives, methods of implementing these objectives, and the approaches by which the methods might be blended.
433. **RETAIL STORE MANAGEMENT (5).** Pr., MT 331, 336, 341, ACF 212, and junior standing. Principles and practices in the scientific operation of the retail store. Store location, layout, buying, pricing, and merchandise control.
434. **PURCHASING (5).** Pr., MT 331, 336 or COI and junior standing. Objectives, control, and the direction of industrial purchasing.
436. **MARKETING RESEARCH METHODOLOGY (5).** Pr., MT 331, 336, 341, and junior standing. Methods of scientific research in the field of marketing and their application to the solution of marketing problems.
437. **SALES MANAGEMENT (5).** Pr., MT 331, 336, 341, and junior standing. Principles and practices of sound organization and administration of sales organization. Includes consideration of: sales department organization, selecting, training, compensating, and supervising sales planning, setting up sales territories and quotas.
438. **MARKETING CHANNEL SYSTEMS (5).** Pr., MT 331, 336, or COI, 341, and junior standing. The nature and role of marketing channels. Major marketing strategy problems such as designing channel objectives and constraints, distinguishing major channel alternatives, and motivating, evaluating, and controlling channel members.
440. **INTERNATIONAL MARKETING (5).** Pr., MT 331, 341, completion of freshman math requirement, and junior standing. Adapting the marketing process of the domestic firm to international operations and the institutional structure that exists to service foreign markets and the practice of marketing administration by firms operating within these markets.
490. **SPECIAL PROBLEMS IN MARKETING (1-10).** Pr., MT 331 and senior standing. Qualified students conduct investigations of special problems in Marketing. (May be repeated for a maximum of 10 hours credit.)
498. **MARKETING STRATEGY (5).** Pr., MT 331, 336, 341, 436 and 10 hours of Marketing. An integrative capstone course for marketing majors.

ADVANCED UNDERGRADUATE AND GRADUATE

581. **SPECIAL STUDIES IN MARKETING RESEARCH (5).** Pr., COI, MT 336, 341, 436; for graduate students, COI and MT 531 or equivalent. Specialized in-depth study and research projects within a particular subject area.
582. **SPECIAL STUDIES IN RETAILING/MERCHANDISING (5).** Pr., COI, MT 336, 341, 433; for graduate students, COI and MT 531 or equivalent. Specialized in-depth study and research projects within a particular subject area.
583. **SPECIAL STUDIES IN PROMOTION (5).** Pr., COI MT 336, 341, 432 and choice of MT 436 or 437; for graduate students, COI, and MT 531 or equivalent. Specialized in-depth study and research projects within a particular subject area.

GRADUATE

531. **SURVEY OF MARKETING MANAGEMENT (5).** Pr., consent of the Director of Graduate Studies, School of Business. An accelerated course in marketing concepts and practices.
632. **MARKETING COMMUNICATIONS (5).** Pr., MT 531 or equivalent. A managerial perspective of the marketing communications process.
636. **MARKETING RESEARCH: METHODOLOGY AND APPLICATIONS (5).** Pr., MT 531 and MN 574 or equivalent. Examination of accepted marketing research techniques with emphasis on research design, implementation, and data analysis from the point of view of Marketing Management.
641. **BUYER BEHAVIOR (5).** Pr., MN 570 and MT 650. In-depth analysis of the major psychological, sociological, and organizational behavior concepts involved in consumer and industrial buyer behavior.
650. **MARKETING MANAGEMENT (5).** Pr., all foundation courses. In-depth analysis of concepts and principles pertinent to executive decision-making in marketing.
690. **SPECIAL PROBLEMS (1-5).** Variable content in the marketing or transportation areas.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Transportation

372. **ECONOMICS OF TRANSPORTATION (5).** Pr., EC 200 and junior standing. The development of systems of transportation. Analysis of rates and their effects upon Commerce and Industry. Government regulation of transportation agencies.
473. **PHYSICAL DISTRIBUTION MANAGEMENT (5).** Pr., MT 331 or 372 and junior standing. Fundamentals of physical distribution activities and their interrelationships in the management of the distribution process.
474. **INDUSTRIAL TRAFFIC MANAGEMENT (5).** Pr., MT 372. Problems and policies involved in the traffic management function of the industrial firm.

475. **TRANSPORTATION AND REGULATED INDUSTRIES (5).** Pr., MT 372 or COI and junior standing. Economic, legislative, and administrative problems related to regulation of transportation and utility rates and services.
476. **TRANSPORT ENTERPRISE MANAGEMENT (5).** Pr., MT 372 or COI and junior standing. Problems and policies in the management and administration of transport enterprises of different modal types, primarily air, rail, and motor.
477. **BUSINESS LOGISTICS (5).** Pr., MT 372, 473 and MN 274. Problems and analysis in the design and management of logistics systems.
484. **SPECIAL STUDIES IN TRANSPORTATION/LOGISTICS (5).** Pr., MT 372, and two from 473, 475, and 476. Specialized in-depth study and research projects within a particular subject area.
490. **SPECIAL PROBLEMS IN TRANSPORTATION (1-10).** Pr., MT, 372 and senior standing. Qualified students conduct investigations of special problems in Transportation. (May be repeated for a maximum of 10 hours credit.)

GRADUATE

671. **LOGISTICS MANAGEMENT (5).** Pr., COI. Analysis of major logistics elements within the total system of the firm. A problem-oriented approach is employed in developing a managerial perspective.
672. **TRANSPORT ECONOMICS AND PUBLIC POLICY (5).** Pr., EC 200-202 or equivalent. An examination of the U.S. transport system and an analysis of public policy issues regarding regulatory objectives and efficiency of resource use in transportation.
690. **SPECIAL PROBLEMS (1-5).** Variable content in the marketing or transportation areas.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Materials Engineering (MTL)

Professors Jemian, *Chairman*, Hall, and Hsu
Associate Professors Budenstein, Slagh, and Wilcox

Responsibility for this curriculum, which is described on page 155, rests with the interdisciplinary Materials Engineering Curriculum Committee. Questions should be directed to the Department of Mechanical Engineering which administers the program.

202. **ENGINEERING MATERIALS SCIENCE-STRUCTURE (3).** Pr., CH 103, PS 220 or 205. Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations. (Same course as ME 202.)
304. **ENGINEERING MATERIALS SCIENCE—PROPERTIES (3).** Pr., MTL 202, ME 207. Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials. (Same course as ME 304.)
335. **ENGINEERING MATERIALS SCIENCE—PHYSICAL METALLURGY (4).** LEC. 3, LAB. 3. Pr., MTL 304. Relations between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations. (Same course as ME 335.)
336. **PHYSICAL ANALYSIS OF MATERIALS I (4).** LEC. 3, LAB. 3. Pr., MTL 338. The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students. (Same course as ME 336.)
337. **PHYSICAL ANALYSIS OF MATERIALS II (4).** LEC. 3, LAB. 3. Pr., MTL 336, and ME 308. The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed. (Same course as ME 337.)
338. **PHASE DIAGRAMS (4).** LEC. 3, LAB. 3. Pr., MTL 335. Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics. (Same course as ME 338.)
425. **THERMODYNAMICS OF MATERIALS SYSTEMS (4).** Pr., ME 301 and MTL 338. The laws of thermodynamics applied to the stability of materials phases, crystal imperfections, solubility, oxidation, surface and interfacial energy, and transformations. (Same course as ME 425.)
435. **PHYSICAL ANALYSIS OF MATERIALS III (4).** LEC. 3, LAB. 3. Pr., MTL 445, and MTL 337. The evaluation of microscopic structural features, anisotropic materials properties and the detection and interpretation of flaws. Microscopy, radiography and other non-destructive test methods will be employed. (Same course as ME 435.)
445. **TRANSFORMATIONS IN CONDENSED PHASES (4).** LEC. 3, LAB. 3. Pr., MTL 337, MTL 425, and ME 536. Important transformations in both metallic and non-metallic materials with crystalline or glass structures. Structures, mechanisms, distinctive characteristics and applications will be studied. Selected transformations will be studied in the laboratory. (Same course as ME 445.)

446. **THEORETICAL MATERIALS ENGINEERING (3).** Pr., MTL 575, MTL 570, coreq., MTL 513. The physical properties of materials in relation to modern theories. (Same course as ME 446.)
447. **MECHANICS OF ENGINEERING MATERIALS (4).** LEC. 3, LAB. 3. Pr., MTL 516, and MTL 536. The mechanical properties in relation to structural features of alloys, plastics, ceramic materials and composites under static, dynamic and cyclic service and test conditions. Conditions for the attainment of optimum properties and behavior will be emphasized. (Same course as ME 447.)
448. **INTRODUCTION TO CERAMICS (3).** Pr., MTL 335, Coreq., MTL 445. The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included. (Same course as ME 448.)

ADVANCED UNDERGRADUATE AND GRADUATE

513. **INTRODUCTION TO X-RAY CRYSTALLOGRAPHY (5).** LEC. 4, LAB. 3. Pr., MTL 435. Principles of crystallography, the reciprocal lattice, theory of x-ray diffraction, and the powder, Laue, and diffractometer methods. (Same course as PS 513.)
515. **POLYMER TECHNOLOGY I (4).** LEC. 3, LAB. 3. Pr., CH 304 or CHE 560. Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture. (Same course as CH 515.)
516. **POLYMER TECHNOLOGY II (3).** LEC. 3. Pr., MTL 515 or TE 424. Continuation of MTL 515. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use. (Same course as CH 516.)
536. **ENGINEERING MATERIALS SCIENCE-FERROUS METALLURGY (3).** Pr., MTL 335. Design of ferrous metals following modern theory and practice. Hardenability, alloying deformation, and special purpose steels. (Same course as ME 536.)
570. **ELECTRICAL PROPERTIES OF MATERIALS (3).** Pr., MTL 337, and EE 263. Studies of the electrical properties of materials with emphasis on semiconductors (Same course as EE 570.)
575. **RATE PROCESSES IN MATERIALS (3).** Pr., CH 508, MTL 445, or COI and junior standing. Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials. (Same course as CHE 575.)

Mathematics (MH)

Professors B. Fitzpatrick, Head, Ball, J. Brown, Burton, Butz, P. Fitzpatrick, Haynsworth, Hill, Lindner, Reed, Rogers, and Zenor

Associate Professors S. Brown, Coleman, J. Ford, R. Ford, Hinrichsen, Holmes, Hudson, Kozlowski, W. Kuperberg, Robinson, Transue, Wall, and Young

Assistant Professors Day, Greenwell, Grone, Gruenhagen, Jellett, Johnson,

K. Kuperberg, Mathis, Minc, Nyikos, Pate, Phillips, Smith, and Zalik

Instructors Bayne, Bennett, Broline, J. Brown, Christian, Golightly, Hoffman, King, Litz, Murphy, Vause, and White

100. **MATHEMATICAL INSIGHTS (5).** For students in the arts or humanities. The purpose of this course is to give such students insight into the nature of mathematics by engaging them in mathematical thought processes within a suitable elementary framework. Prior credit for any other University mathematics course precludes credit for this course.
140. **COLLEGE ALGEBRA (5).** Pr., high school geometry, second year high school algebra or departmental approval.* Algebraic techniques, coordinate geometry, functions and relations and their graphs, and common logarithms. A preparatory course for MH 151, MH 160 and MH 161. However, credit is not allowed for both MH 140 and MH 160.
151. **FINITE MATHEMATICS (5).** Pr., MH 140 or 160. Selections from elementary combinatorial analysis, probability theory, linear algebra, linear programming. Designed for students in the School of Business and not open, except by special permission of the Department of Mathematics, to students in Engineering or to Mathematics or Physics majors.
160. **PRE-CALCULUS WITH TRIGONOMETRY (5).** Pr., high school geometry, second year high school algebra or departmental approval.* The basic analytic and geometric properties of the algebraic and trigonometric functions with heavy emphasis on the latter. A preparatory course for the calculus sequence. Students who need a review of algebraic techniques should take MH 140. However, credit is not allowed for both MH 140 and MH 160.
161. **ANALYTIC GEOMETRY AND CALCULUS (5).** Pr., MH 140 or 160. Limits, the derivative, applications of the derivative, antiderivatives, the conic sections.

*This is a non-credit course for students in some scientific and technical curricula.

- 162-163. ANALYTIC GEOMETRY AND CALCULUS (5-5).** Pr., MH 160 and 161. Integrals, the fundamental theorem of calculus, applications of the integral, the calculus of the exponential and logarithmic functions. The calculus of the trigonometric and inverse trigonometric functions, techniques of integration, indeterminate forms, improper integrals.
- 163L. CALCULUS LABORATORY I (1).** LEC. 1, LAB. 1. Coreq., MH 163. Selected calculus problems will be studied with the computer as an aid.
- 264. ANALYTIC GEOMETRY AND CALCULUS (5).** Pr., MH 163. A continuation of MH 161-162-163. Infinite series, partial derivatives, multiple integrals.
- 264L. CALCULUS LABORATORY II (1).** LEC. 1, LAB. 1. Coreq., MH 264. This course will emphasize problems arising in the context of MH 264.
- 265. LINEAR DIFFERENTIAL EQUATIONS (3).** Coreq., MH 264. First and second-order linear differential equations including the solution of such equations by infinite series.
- 266. TOPICS IN LINEAR ALGEBRA (3).** Pr., MH 163. Linear spaces, vector spaces, linear transformations, matrices and determinants. Not open to students who have credit for MH 531 or MH 505 or MH 537.
- 267. INTRODUCTORY PROBABILITY AND STATISTICS (5).** Coreq., MH 161. Designed for students whose fields require a basic knowledge of probability and for those who plan to take upper level courses in probability and statistics. Conditional probability, independence and random variables with emphasis on discrete random variables.
- 269. ELEMENTARY DIFFERENTIAL EQUATIONS (5).** Coreq., MH 264. Ordinary differential equations with applications. Credit for this course precludes credit for MH 265.
- 281-282-283. ELEMENTARY MATHEMATICS (5-5-3).** Pr., sophomore standing. These courses provide appropriate mathematical insights for elementary school teachers. Emphasis is on the structure of the number systems, the basic concepts of algebra and informal geometry. Open for credit only to students in Elementary Education, except by special permission of the Department of Mathematics.
- 301. HISTORY OF MATHEMATICS (3).** Pr., MH 163 or departmental approval. The evolution of modern mathematics from its motivational roots in the physical sciences; the lives and contributions of outstanding mathematicians; the parallel development of mathematics and western culture.
- 331-332. INTRODUCTION TO MODERN ALGEBRA I, II (5-5).** Pr., MH 163. Sets, mapping, the integers, isomorphisms, and homomorphisms; groups, rings, fields, ideals.
- 362. ENGINEERING MATHEMATICS I (3).** Pr., MH 265. Fourier Series, partial differential equations, special functions.
- 491. SPECIAL PROBLEMS (1-5).** Pr., departmental approval, junior standing. An individual problems course. Each student will work under the direction of a staff member on some problem of mutual interest.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. THE CALCULUS OF VECTOR FUNCTIONS (3).** Pr., MH 266 or departmental approval. Derivative and integral of vector functions, gradient, divergence, curl, Green's Theorem, Stokes Theorem.
- 503. ENGINEERING MATHEMATICS II (5).** Pr., MH 265. Complex numbers, functions, mappings, residues, contour integration.
- 505. MATRIX THEORY AND APPLICATIONS (5).** Pr., MH 266 or 531. Canonical forms, determinants, linear equations, characteristic value problems.
- 506. ELEMENTARY PARTIAL DIFFERENTIAL EQUATIONS (3).** Pr., MH 362. First and second order linear partial differential equations with emphasis on the methods of eigenfunction expansions.
- 507. INTRODUCTION TO CELESTIAL MECHANICS (5).** Pr., departmental approval. Dynamics of a particle, two-body problems, coordinate transformations, series expansions in elliptic motion, introduction to general perturbation theory.
- 508. ELEMENTS OF NUMERICAL ANALYSIS (5).** Pr., MH 264. The numerical solutions of selected problems arising in calculus and algebra along with the programming techniques.
- 510-511. CALCULUS OF VARIATIONS I, II (3-3).** Pr., MH 265 or 269. Fundamental concepts of extrema of functions and functionals; the simplest problem of the calculus of variations; first and second variations; generalizations of the simplest problem; sufficient conditions; constrained functionals; the general Lagrange problem; optimal control.
- 515. ALGEBRA FOR APPLIED MATHEMATICS (5).** Pr., MH 266. Ideas and techniques of modern algebra which are useful to applied mathematicians, engineers, and scientists. Topics chosen from binary relations and graphs; semigroups, monoids, and groups; finite-state machines (automata); Boolean algebra; coding theory.
- 518. ANALYSIS FOR APPLIED MATHEMATICS (5).** Pr., MH 265, 266. Linear functions and transformations, concepts of the calculus including uniform continuity and uniform convergence, curves, series of functions, complex differentiation and differential equations. Designed primarily for students in engineering, physical sciences and applied mathematics who are likely to pursue more advanced work. Not open for credit to students in the MH curriculum.
- 520-521-522. ANALYSIS I, II, III (5-5-5).** Pr., MH 264. The real number system, theorems concerning number sets, sequences, graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation, functions whose domains are in Euclidean spaces.

524. **FOURIER ANALYSIS (5).** Pr., MH 521; an ability to program Fortran. Convergence and oscillation theorems for Fourier Series. Gibbs phenomenon. Fourier transform. Fast Fourier transform.
- 528-529. **LINEAR DIFFERENTIAL SYSTEMS (3-3).** Pr., MH 522 or departmental approval. Systems of linear ordinary differential equations, series solutions, approximate solutions.
531. **INTRODUCTION TO MODERN ALGEBRA III (5).** Pr., MH 332. A continuation of MH 331-332.
537. **LINEAR ALGEBRA (5).** Pr., MH 266 and 332. Linear transformations, matrix algebra, finite-dimensional vector spaces.
- 541-542. **GEOMETRY, A MODERN VIEW I, II (5-5).** Pr., MH 163. A development of geometry using the real number system and measurement as proposed by G. D. Birkhoff. The course moves rapidly, with definitions and proofs, through the foundations of geometry and into the main body of geometric theory.
543. **LINEAR GEOMETRY (5).** Pr., MH 163. Transformations in projective, affine, and Euclidean planes.
544. **COMBINATORIAL GEOMETRY IN THE PLANE (5).** Pr., MH 163. Helly's and related theorems.
- 550-551. **METRIC SPACES (3-3).** Pr., MH 521 or departmental approval. The elementary properties of metric spaces with special attention to the line and the plane.
560. **INTRODUCTION TO NUMERICAL ANALYSIS (5).** Pr., MH 265, 269 or 528; an ability to program in Fortran. Polynomial approximation, numerical differentiation and integration, solution of ordinary differential equations (initial value problems), error analysis.
561. **NUMERICAL MATRIX ANALYSIS (5).** Pr., MH 266 or 531, an ability to program Fortran. Numerical solution of algebraic equations and of systems of linear equations, solution of boundary value problems, numerical calculation of characteristic values and vectors, error analysis.
564. **PROBABILITY THEORY (5).** Pr., MH 520 or departmental approval. Complete probability fields, probability functions, random variables, convergent sequences of random variables, conditional probability, distribution functions, various applications.
567. **MATHEMATICAL STATISTICS I (5).** Pr., MH 264. Introduction to probability. Random variables, discrete and absolutely continuous distributions. Standard distributions (binomial, Poisson, hypergeometric, normal, etc). Expected values, moments, and moment generating functions. Convergence and limiting distributions. Emphasis on problem solving.
568. **MATHEMATICAL STATISTICS II (5).** Pr., MH 567. Statistical methods. Estimation, sampling theory, confidence intervals, hypothesis testing, regression, analysis of variance.
569. **TOPICS IN PROBABILITY AND STATISTICS (1-5).** (May be repeated for credit). Pr., MH 567 or COI. A mathematical treatment of certain topics in probability and statistics. Topics will vary from year to year and will be chosen from the following: Applied stochastic process, time series, experimental design, sampling theory, non-parametric methods, and others.
571. **DISCRETE OPTIMIZATION THEORY (5).** Pr., MH 163. An introduction to the mathematical aspects of theoretical computer science.
- 573-574. **COMBINATORIAL MATHEMATICS I, II (5-5).** Pr., MH 163. Distinct representatives, generating functions, inversion formulae, permutations and combinations, difference sets, block designs, finite geometries, orthogonal latin squares, coding theory.
575. **GRAPH THEORY (5).** Pr., MH 163. Connectivity, traversability, coverings, planarity, colorability, digraphs, algorithms and applications.
581. **FOUNDATIONS OF GROUP THEORY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Elements of the theory of groups emphasizing geometric and other examples.
582. **FOUNDATIONS OF STATISTICS FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Discrete probability distributions; introduction to statistical inference.
583. **FOUNDATIONS OF LINEAR ALGEBRA FOR SECONDARY SCHOOL TEACHER* (4).** Pr., one course above MH 163. Matrix algebra, quadratic forms with emphasis on geometric interpretations in two and three dimensions.
584. **FOUNDATIONS OF NUMBER THEORY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Divisibility, Diophantine equations, congruences.
585. **FUNDAMENTALS OF ALGEBRA FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Structure of the ring of integers; polynomial rings.
586. **FOUNDATIONS OF NON-EUCLIDEAN GEOMETRY FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. B.L. geometry, hyperbolic geometry, absolute geometry, parallel postulates.
587. **FUNDAMENTALS OF ANALYSIS FOR SECONDARY SCHOOL TEACHERS* (4).** Pr., one course above MH 163. Mathematical analysis with emphasis on basic principles and relationships. Students will develop the theory from basic concepts.
- 588-589. **CERTIFICATION MATHEMATICS FOR SECONDARY SCHOOL TEACHERS* (5-5).** Pr., undergraduate major in mathematics and departmental approval. Summer. For secondary school teachers who are working toward Class A certification. Topics will be selected from analysis, algebra and geometry according to the needs and interests of the students enrolled.

*Not available to majors or graduate students in the area of science or mathematics.

GRADUATE

- 602-603. CELESTIAL MECHANICS I, II (5-5).** Pr., MH 507 or departmental approval. Elliptic motion, potentials of attracting bodies, numerical integration and differential correction of orbits, lunar theory, theory of perturbations, Lagrange's method and introduction to canonical variables, the disturbing function, artificial satellite orbit theory.
- 607-608-609. APPLIED MATHEMATICS I, II, III (5-5-5).** Pr., approved graduate standing. Scalar, vector, and dyadic fields; equations governing fields; Helmholtz's and Laplace's equations in curvilinear coordinates; separation of variables; boundary conditions and eigenfunctions; Green's functions.
- 610. SPECIAL FUNCTIONS (5).** Pr., departmental approval.
- 613. TENSOR ANALYSIS (5).** Pr., departmental approval.
- 620-621. FUNCTIONS OF REAL VARIABLES I, II (5-5).** Pr., departmental approval. Measure theory and Lebesgue integration.
- 622-623. FUNCTIONS OF A COMPLEX VARIABLE I, II (5-5).** Pr., departmental approval. Complex numbers; analytic functions; derivatives, Cauchy integral theorem and formula, Taylor and Laurent series; analytic continuation; residues, maximum principle; Riemann surfaces; conformal mapping; families of analytic functions.
- 624-625-626. NORMED LINEAR SPACES (5-5-5).** Pr., departmental approval. Bounded linear transformations and linear functionals on Banach and Hilbert spaces, including conjugate spaces, adjoint operations, self adjoint operators, spectral theory, applications to particular spaces.
- 628-629. ADVANCED THEORY OF DIFFERENTIAL EQUATIONS (5-5).** Pr., departmental approval. Existence, uniqueness and continuation theorems for ordinary and partial differential equations; nature of solutions. The first quarter will be devoted to ordinary equations, the second to partial differential equations.
- 631-632. MODERN ALGEBRA I, II (5-5).** Pr., departmental approval. Numbers; sets; groups; rings; fields of polynomials; Galois theory.
- 633. THEORY OF GROUPS (5).** Pr., MH 631. Sylow theory, abelian groups, chain conditions.
- 634. THEORY OF RINGS (5).** Pr., MH 632 or departmental approval. Structure of rings, ideals in commutative rings.
- 635. ABELIAN GROUPS (5).** Pr., departmental approval. An axiomatic development of abelian group theory: decomposition theorems, finitely generated groups, rank, divisible groups, pure subgroups, basic subgroups, ulm factors.
- 637-638-639. MATRICES (5-5-5).** Pr., MH 537. Special types of matrices; reduction to canonical form; function of matrices; readings in current literature.
- 640-641-642. FUNCTIONAL ANALYSIS (5-5-5).** Pr., MH 626 or departmental approval. Topics in the advanced theory of linear functionals and operators on Banach and Hilbert spaces, chosen to lead students into research work in this field.
- 650-651-652. GENERAL TOPOLOGY (5-5-5).** Pr., departmental approval. An axiomatic development of point set topology; connectivity, compactness, separability, topological equivalence, well-ordering, inner limiting sets, Cartesian products.
- 653. DIMENSION THEORY (5).** Pr., departmental approval. The topological study of dimension in separable metric spaces.
- 654-655-656. POINT-SET TOPOLOGY (5-5-5).** Pr., MH 652. Upper semi-continuous collections, indecomposable continua, metrization problems, inverse limits, other topics.
- 657-658. EUCLIDEAN TOPOLOGY (5-5).** Pr., MH 650. Topology with emphasis on those areas which distinguish among the polyhedra in Euclidean spaces (e.g., Theory of Retracts).
- 661. ADVANCED NUMERICAL ANALYSIS (5).** Pr., MH 561, and 265 or 528. Numerical solution of partial differential equations.
- 664-665-666. PROBABILITY (5-5-5).** Pr., knowledge of Lebesgue integration. Probability measures, random variables, distribution functions (discrete, absolutely continuous, and singular), expectation, characteristic functions (Fourier transforms), independence, limit theorems, convergence to Poisson and normal distributions, central limit theorem, Stochastic processes and Brownian motion, probability measures on metric spaces.
- 667-668-669. MATHEMATICAL THEORY OF APPLIED STATISTICS (5, 5, 5).** Pr., MH 505 and 568, or equivalent. A rigorous mathematical development of some of the important topics in applied statistics. Analysis of variance and covariance, linear models and regression. Introduction to experimental design, Latin squares, incomplete blocks, confounding, simple random sampling, stratified sampling methods. Non-parametric methods.
- 670. UNIFORM SPACES (5).** Pr., MH 652 and departmental approval. Uniform spaces, uniform topology, uniformly continuous functions, completions of uniform spaces, other topics.
- 673-674-675. COMBINATORIAL THEORY (5-5-5).** Pr., MH 332. Topics of current interest in combinatorial theory to include enumeration theory, systems of distinct representatives, latin squares, quasigroups, block designs, Steiner triple systems, Room squares, and finite geometries.
- 677-678-679. MULTIVARIATE STATISTICAL ANALYSIS (5, 5, 5).** Pr., 505 and 568, or equivalent. A rigorous mathematical development of multivariate statistical analysis. The Wishart distribution, Hotelling's T^2 distribution and its applications, discriminant analysis, principal components, factor analysis, multivariate normal distribution, simple, partial, multiple correlation.

- 691. DIRECTED READING IN ALGEBRA. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
- 692. DIRECTED READING IN ANALYSIS. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
- 693. DIRECTED READING IN APPLIED MATHEMATICS. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
- 694. DIRECTED READING IN GEOMETRY. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
- 695. DIRECTED READING IN TOPOLOGY. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
- 696. DIRECTED READING IN MATRIX THEORY. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
- 697. DIRECTED READING IN NUMERICAL ANALYSIS. (CREDIT TO BE ARRANGED.) Pr., 10 hours of 600 courses in the area.
- 699. RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.) May be repeated for credit.
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)

Mechanical Engineering (ME)

Professors Beckett, Head, Barbin, Bussell, Dyer, Jemian,
 Jones, Maples, Penrod, Reece, Shaw, Swinson, and Vachon
 Associate Professors Cooley, Fluker, Goodling, Hoyle, Leppert,
 Scarborough, Smith, Wilcox, and Yu
 Assistant Professors Badr, Madsen, Maxwell, and Turner
 Adjunct Professor McDaniel
 Adjunct Assistant Professor Tytula

- 202. ENGINEERING MATERIALS SCIENCE—STRUCTURE (3). Pr., CH 103, PS 220 or 205. Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations. (Same course as MTL 202.)
- 205. APPLIED MECHANICS—STATICS (4). Coreq., MH 264 and PS 220. Resolution and composition of forces; equilibrium of force systems; friction; second moments.
- 207. STRENGTH OF MATERIALS I (3). Pr., ME 205 and MH 264; coreq., MH 265. Fundamentals of stress and strain; stress-strain relations; temperature effects; bar with axial force; thinwall cylinders; torsion.
- 211. ENGINEERING METHODS (2). LEC 1, LAB. 3. Coreq., PS 222. Presentation and practices in use of techniques of analysis of engineering models.
- 301. THERMODYNAMICS I (4). Pr., MH 264 and PS 220. Laws of thermodynamics; energy transformations; properties and relationships among properties; equations of state and simple processes and cycles.
- 302. THERMODYNAMICS II (3). Pr., ME 301. Thermodynamic analysis of real and ideal cycles, and concepts of compressible fluid flow.
- 303. THERMODYNAMICS III (3). Pr., ME 301. Property determination, Maxwell's relations, thermodynamics of mixtures, combustion, and chemical equilibrium.
- 304. ENGINEERING MATERIALS SCIENCE—PROPERTIES (3). Pr., ME 202, 207. Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials. (Same course as MTL 304.)
- 308. COMPUTATION LABORATORY (3). LEC. 2, LAB. 3. Pr., MH 265. Application of analog and digital programming in Mechanical Engineering.
- 309. CORRELATIVE EXPERIMENTAL MECHANICS (2). LEC. 1, LAB. 3. Pr., ME 207. Theories of failure; determination of stress fields by experimental techniques; introduction to photoelasticity; strain gages; relation of uniaxial test data to failure envelopes.
- 310. THERMODYNAMICS (5). Winter. Pr., MH 163 and PS 206 or equivalent. Gases and vapors; cycles; mass and heat transfer. Open to non-Mechanical Engineering students only.
- 316. STRENGTH OF MATERIALS II (4). LEC. 3, LAB. 3. Pr., ME 207, 309. Applications of theory with emphasis on experimental verification; structures consisting of bars subjected to axial force and/or torsion; spherical and cylindrical thin wall pressure vessels; beams and long columns.
- 321. DYNAMICS I (4). Pr., ME 205; coreq., MH 265. Kinematics of points, lines, and rigid bodies; relative motion and coordinate transformations; kinetics; conservation of energy and momentum.
- 322. DYNAMICS II (4). Pr., ME 211 and 321. Matrix methods in kinematics; introduction to celestial mechanics; Euler's equations of motion; the inertia tensor; gyroscopic motion.
- 323. DYNAMICS OF MACHINES (4). LEC. 3, LAB. 3. Pr., ME 207, 308, 322. Analysis of rotating systems. Dynamic force analysis of mechanisms and complexes of mechanisms. Oscillating systems.

335. **ENGINEERING MATERIALS SCIENCE—PHYSICAL METALLURGY (4).** LEC. 3, LAB. 3. Pr., ME 304. Relations between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations. (Same course as MTL 335.)
336. **PHYSICAL ANALYSIS OF MATERIALS I (4).** LEC. 3, LAB. 3. Pr., ME 308. The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students. (Same course as MTL 336.)
337. **PHYSICAL ANALYSIS OF MATERIALS II (4).** LEC. 3, LAB. 3. Pr., ME 308, 336. The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed. (Same course as MTL 337.)
338. **PHASE DIAGRAMS (4).** LEC. 3, LAB. 3. Pr., ME 335. Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics. (Same course as MTL 338.)
340. **FLUID MECHANICS I (3).** Pr., ME 301 and 321; coreq., ME 207. Fluid properties; fluid statics; fluid kinematics; integral forms of conservation laws—applications to exterior and interior flows; dimensional analysis.
341. **FLUID MECHANICS II (4).** Pr., ME 207 and 340; coreq., ME 302, 322. Potential theory, vorticity, stream functions; viscous flow; boundary layers; turbulent flow.
412. **MEASUREMENTS LABORATORY (3).** LEC. 2, LAB. 3. Pr., ME 308, 303, 341, 521 and 527. The theory and practice of engineering measurements, including treatment of experimental data and the design of experiments.
420. **THERMAL SYSTEMS LABORATORY (2).** LEC. 1, LAB. 3. Pr., ME 412; coreq., ME 415. Selected experiments on thermal systems evaluation.
425. **THERMODYNAMICS OF MATERIALS SYSTEMS (4).** Pr., ME 301 and 338. The laws of thermodynamics applied to the stability of materials phases, crystal imperfections, solubility, oxidation, surface and interfacial energy, and transformations. (Same course as MTL 425.)
434. **FLUID MECHANICS AND HEAT TRANSFER (5).** Pr., ME 310. Spring. Mechanics of compressible and incompressible fluids; transmission of heat by conduction, convection, and radiation. Open to non-Mechanical Engineering students only.
435. **PHYSICAL ANALYSIS OF MATERIALS III (4).** LEC. 3, LAB. 3. Pr., ME 337. The evaluation of macroscopic structural features, anisotropic materials properties and the detection and interpretation of flaws. Microscopy, radiography and other nondestructive test methods will be employed. (Same course as MTL 435.)
439. **MECHANICAL ENGINEERING DESIGN I (4).** LEC. 3, LAB. 3. Pr., ME 323, 316; coreq., ME 335, 527. Design of machine elements for static and dynamic stresses with the emphasis on synthesis and creative design.
440. **MECHANICAL ENGINEERING DESIGN II (3).** LEC. 2, LAB. 3. Pr., ME 439, or departmental approval, senior standing. The solution of typical engineering systems problems by group or team effort, requiring the development of skill and co-operation in the use of analysis, synthesis, creative design and optimization.
441. **ENGINEERING SYSTEMS (CREDIT 1-5).** Pr., senior standing and departmental approval. May be taken more than one quarter, but total credit may not exceed 10 quarter hours. Mechanical Engineering design problems requiring the development of skill in the use of analysis, synthesis and creativeness in the design of engineering systems.
444. **DESIGN FOR HAZARD REDUCTION (4).** Pr., ME 207, 321. Relationships of the mechanics of machinery and the properties of materials which lead to the design principles of hazard reduction in machines and machine systems. Open to non-Mechanical Engineering students only.
445. **TRANSFORMATIONS IN CONDENSED PHASES (4).** LEC. 3, LAB. 3. Pr., ME 337, 425, and 536. Important transformations in both metallic and non-metallic materials with crystalline or glass structures. Structures, mechanisms, distinctive characteristics and applications will be studied. Selected transformations will be studied in the laboratory. (Same course as MTL 445.)
446. **THEORETICAL MATERIALS AND ENGINEERING (3).** Pr., CHE 575 and EE 570; coreq., PS 513. The physical properties of materials in relation to modern theories. (Same course as MTL 446.)
447. **MECHANICS OF ENGINEERING MATERIALS (4).** LEC. 3, LAB. 3. Pr., CH 516, and ME 536. The mechanical properties in relation to structural features of alloys, plastics, ceramic materials and composites under static, dynamic and cyclic service and test conditions. Conditions for the attainment of optimum properties and behavior will be emphasized. (Same course as MTL 447.)
448. **INTRODUCTION TO CERAMICS (3).** Pr., ME 335 and 445. The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included. (Same course as MTL 448.)
449. **PROFESSIONAL DIAGNOSTIC PROBLEMS (4).** Pr., senior standing in any engineering curriculum or departmental approval. Problems involving interaction of the different engineering science disciplines, with emphasis on engineering design, synthesis, and systems.
450. **SPECIAL PROBLEMS. (CREDIT 1-5).** Pr., departmental approval, junior standing. Individual student endeavor under staff supervision involving special problems of an advanced nature. May be taken more than one quarter but total credit may not exceed 10 quarter hours. Maximum any one quarter 5 hours credit.
451. **ADVANCED PROJECTS (3).** LEC. 1, LAB. 6. Pr., ME 341, 421; coreq., ME 440, and senior standing. Individual projects of a current nature, involving both analysis and synthesis, culminating in a formal report.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **STATISTICAL THERMODYNAMICS (3).** Pr., ME 301 or departmental approval. Fundamental laws of thermodynamics and thermodynamic properties from the microscopic point of view.
502. **INTRODUCTION TO OPTIMAL SYSTEMS (4).** Pr., MH 310. Application of optimal criteria to engineering problems.
503. **SENSITIVITY ANALYSIS (5).** Pr., IE 410 or equivalent and junior standing. Analysis of the sensitivity of performance of a system or process to changes in the parameters of the system.
510. **POWER PLANT SYSTEMS (5): LEC. 3, LAB. 4.** Pr., ME 302, senior standing. Theory, design, performance and applications of power plant systems.
514. **TURBOMACHINES (4).** Pr., ME 341 or departmental approval. Applications of fluid, mechanics to turbomachines, such as pumps, compressors, fluid couplings, control devices, gas and steam turbines.
515. **THERMODYNAMICS OF POWER SYSTEMS (4).** Pr., ME 302, 303, 341; coreq., ME 521 or departmental approval. Design and analysis of static and dynamic thermal power systems.
521. **HEAT TRANSFER (4).** Pr., ME 340, EE 263, MH 265, or departmental approval. Fundamental principles of heat transfer by steady and unsteady conduction, thermal and luminous radiation, boiling and condensation, free and forced convection.
522. **TRANSPORT PROCESSES (3).** Pr., ME 521 or departmental approval. Transport processes involving mass, momentum, and energy transfer combined with heat and mass transfer in chemical reacting boundary layers.
527. **DYNAMICS OF PHYSICAL SYSTEMS (4).** Pr., ME 211, 323, 340. Motion of systems represented by first and second order differential equations. Transient types and response of physical systems. Transfer functions.
528. **AIR CONDITIONING AND REFRIGERATION (4).** Pr., ME 302, 521. Theory and design of heating, cooling and ventilating systems, and refrigeration systems, including cryogenics.
532. **AUTOMATIC CONTROLS (3).** Pr., MH 265, ME 341, 527. Control systems fundamentals. Systems analysis techniques. Applications to machine and process control.
536. **ENGINEERING MATERIALS SCIENCE—FERROUS METALLURGY (3).** Pr., ME 335. Design of ferrous metals following modern theory and practice. Hardenability, alloying deformation, and special purpose steels. (Same course as MTL 536.)
537. **MANUFACTURING PROCESSES AND MATERIALS (5).** Pr., junior standing, ME 335 and COI. Principles and engineering problems involved in the fabrication of materials, in the selection of engineering materials, in tooling and in production methodology.
542. **COMPUTER AIDED DESIGN (3).** Pr., ME 527 or departmental approval. The computer in design. Batch and Interactive processing. The use of typewriter and visual display remote terminals in the development and operation of design systems.
543. **PHOTOELASTIC STRESS AND STRAIN ANALYSIS (3).** Pr., ME 207. Theory of the polariscope; two- and three-dimensional model making and preparation; techniques of data collection and photoelectric models and analysis.

GRADUATE

604. **ADVANCED THERMODYNAMICS I (3).** Pr., ME 303, graduate standing. Classical thermodynamics of reactive and nonreactive systems; applications.
605. **ADVANCED THERMODYNAMICS II (3).** Pr., ME 604. Statistical treatment of the laws and properties of thermodynamic systems; applications.
608. **ADVANCED THERMODYNAMICS III (3).** Pr., ME 605. Thermodynamics of nonequilibrium processes.
620. **HEAT TRANSMISSION—CONDUCTION (3).** Pr., ME 521, MH 362 or departmental approval. Formulations and solutions of steady, steady periodic, and unsteady heat conduction problems.
621. **HEAT TRANSMISSION—CONVECTION (3).** Pr., ME 521. General problems of convection, forced convection heat transfer, free convection, thermodynamic boundary layers, condensing and boiling, heat transfer to liquid metals and analysis of heat exchangers.
622. **HEAT TRANSMISSION—RADIATION (3).** Pr., ME 521. Fundamental laws of radiation, net radiation methods, configuration factors, radiation through absorbing media, solar, terrestrial and celestial radiation, and thermometry and temperature control.
630. **ADVANCED STRENGTH OF MATERIALS (3).** Pr., ME 316, MH 362 or departmental approval. Stress and strain analyses of curved beams and beams on elastic foundations; energy methods; selected topics from the literature; stress and strain analyses in bars of noncircular section subjected to torsion.
631. **THEORY OF ELASTICITY I (3).** Pr., departmental approval. Theory of stress and strain and stress-strain relations. Laws of balance in momentum, moment of momentum, and energy. Solution by tensor stress function and displacement functions.
632. **THEORY OF ELASTICITY II (3).** Pr., ME 631. Continuation of solutions by potential functions. Solutions of two dimensional problems by Kolosov-Muskhelishvili methods.

633. **EXPERIMENTAL STRESS ANALYSIS (3).** Pr., ME 316. Stress analyses by experimental techniques including transmission and scattered light photoelasticity; strain gages, brittle coatings, photoelastic coatings. Moiré patterns are developed.
634. **ELASTIC STABILITY (3).** Pr., ME 631 or departmental approval. Stability of conservative and nonconservative systems. Buckling of slender bars and thin-walled cross-sections; buckling of plates and shells. Buckling loads by Rayleigh-Ritz, Galerkin, and Kantorovich methods.
635. **INTERMEDIATE DYNAMICS (3).** Pr., ME 340, MH 362. Dynamics of particles and systems of particles applied to engineering problems. Work and energy, and impulse and momentum principles. LaGrange's equations and Hamilton's principle.
637. **THEORY OF PLATES (3).** Pr., ME 631. Analyses of plates of various shapes under transverse and in-plane loadings with different boundary conditions. Buckling of plates due to in-plane loadings. Introduction to von Karman large deflection theory.
638. **THEORY OF SHELLS (3).** Pr., departmental approval. Introduction to differential geometry. Development of governing equations for shells under arbitrary loading. Shallow shell theory with applications. Asymptotic method for solution of differential equations in shell theory.
639. **VARIATIONAL MECHANICS (3).** Pr., departmental approval. The problem of Bolza, Mayer and LaGrange with fixed and variable end points; Hamilton's principle and LaGrange's equations; energy method; Rayleigh's principle and Rayleigh-Ritz method; Galerkin method; variational methods; applications.
640. **FLUID DYNAMICS (3).** Pr., MH 362 and graduate standing. Navier-Stokes Equations. Exact and approximate solutions. Euler's equations. Continuity. Energy equations. Irrotational flow.
641. **BOUNDARY LAYER THEORY (3).** Pr., ME 640. Hydrodynamic and thermal boundary layers. Prandtl's equations, integral relations and approximate techniques.
642. **GAS DYNAMICS I (3).** Pr., ME 640. Compressible flow equations; isentropic flow; Fanno line flow; Rayleigh line flow; shock waves; high speed flow; internal and external flows; forces on immersed bodies.
643. **GAS DYNAMICS II (3).** Pr., ME 642 and 605. Continuation of ME 642 with emphasis on real gas effects and non-equilibrium flow.
644. **TURBULENCE (3).** Pr., ME 641. Analysis of wall-affected and free turbulent flows.
660. **STRUCTURE AND PROPERTIES OF SOLIDS (3).** Pr., departmental approval. Denominations of structure are considered, via an interdisciplinary approach, from the viewpoint of providing a fundamental insight with respect to the genesis of selected macroscopic properties.
661. **CORROSION: FUNDAMENTALS AND APPLICATIONS (3).** Pr., departmental approval. Nature and mechanisms of corrosion. Effects of material-manufacturing methods, construction and environment. Corrosion types and methods of corrosion control.
662. **PERFORMANCE OF METALS AT ELEVATED TEMPERATURES (3).** Pr., departmental approval. Fundamental behavior of metals of elevated temperatures. Commercial and experimental types of ferrous and nonferrous alloys and their suitability for elevated temperature applications.
665. **STRENGTHENING OF METALS (3).** Pr., ME 335. A treatment of the six basic mechanisms by which metals are strengthened. Emphasis is placed on causative factors and accompanying manifestations.
666. **PLASTICITY OF METALS (3).** Pr., ME 335. A quantitative treatment of: the minimization of plastic flow, by means of design consideration, where the phenomenon is associated with deleterious effects; the maximization of plastic flow, by means of material-condition and forming method considerations, where the objective is to form or shape.
667. **DISLOCATION THEORY (3).** Pr., departmental approval. The nature and properties of dislocations including crystal structure and imperfections, dislocation geometry in both ideal and real crystals, dislocation configurations, multiplication and interactions with various imperfections, and methods of observation.
675. **PLANAR MECHANISMS (3).** Pr., ME 323. Analysis of simple and complex planar mechanisms. Synthesis by finite displacement and infinitesimal motion methods.
676. **SPATIAL MECHANISMS (3).** Pr., ME 675. Analysis and synthesis of spatial mechanisms.
677. **SELECTED TOPICS IN MECHANICAL DESIGN (3).** Pr., ME 630 and 675. Dynamic properties of trains of mechanisms; hydrostatic and hydrodynamic lubrication; thermal equilibrium; wear and fatigue problems; design techniques utilizing modern computational facilities.
678. **CONCEPTUAL DESIGN OF MECHANICAL SYSTEMS (3).** Pr., ME 440 or departmental approval. Engineering problem definition; solution set development; selection criteria; optimization techniques; utilization of computational methods in the design of components.
679. **DYNAMIC SYSTEMS DESIGN (3).** Pr., ME 527 or departmental approval. Design of time-responsive systems; system modeling and simulation; development of system component requirements; determination of the characteristics of the designed systems.
680. **NOISE CONTROL IN MECHANICAL SYSTEMS (3).** Pr., departmental approval. Sound: its propagation; reflection; absorption; scattering; sources in machinery. Alteration of machine parameters for noise reduction.
681. **DESIGN FOR OPTIMUM ENERGY UTILIZATION (3).** Pr., ME 604 or departmental approval. Design and selection of energy systems for optimum energy utilization in commercial, industrial, residential and transportation sectors.

- 682. **ENVIRONMENTAL SYSTEMS DESIGN (3).** Pr., ME 604 or departmental approval. Design of environmental systems for the support of life, for comfort, for control of local environmental envelopes.
- 683. **SOLAR ENERGY UTILIZATION (3).** Pr., ME 622 or departmental approval. Measurement and utilization of solar energy for terrestrial applications.
- 684. **COMBUSTION AND FUEL TECHNOLOGY (3).** Pr., ME 303 and 521. Conventional and nonconventional fuels, thermodynamics and chemical kinetics of combustion processes, diffusionally and kinetically controlled combustion processes, knocking in internal combustion engines, and instability of flame fronts.
- 687. **AUTOMATIC MACHINERY AND PROCESS (5).** Pr., ME 532 or equivalent. Analysis and control of automatic machinery and automatic processes. Design and layout of production machinery for automatic and continuous flow.
- 688. **PRODUCTION ENGINEERING LABORATORY (2-5).** Pr., ME 537 or equivalent. Actual production problems associated with highly engineered products are addressed with the goal of reducing transition problems between prototype and full production of high-technology components and systems.
- 690. **SEMINAR (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 691. **DIRECTED READING IN MECHANICAL ENGINEERING (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 692. **ENGINEERING ANALYSIS (3).** Pr., departmental approval. Equilibrium, eigenvalue, and propagation problems of continuous systems. Physical laws and mathematical properties discussed with considerable emphasis on numerical solutions.
- 699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 799. **RESEARCH AND DISSERTATION (CREDIT TO BE ARRANGED).** May be taken more than one quarter.

Military Science (MS)

BASIC PROGRAM*

First Year (Freshman)

Military Science I

- 101. **THE U.S. ARMY TODAY AND TOMORROW (1).** LEC. 1. The War Eagle Special! Features a field trip with rafting, camping, and rappelling. Class topics include role of women in the Army, job specialties, military salaries, options available to ROTC graduates through the Army, Army Reserve and National Guard, and contemporary issues concerning today's student.
- 102. **HUMAN RESOURCE MANAGEMENT—THEORY AND PRACTICE (1).** LEC. 1. The War Eagle Special II. Backpacking is the feature adventure trip, but there is also opportunity to brush up on mountaineering skills. The course consists of a series of video presentations on techniques, leadership principles, and traits common to great leaders such as Patton, Kennedy, and Bradley, plus contemporary management theory.
- 103. **FIRST AID (CPR) (1).** LEC. 1. Development of first aid knowledge, skill ability, and personal judgement in basic life support cardiopulmonary resuscitation (CPR).

Second Year (Sophomore)

Military Science II

- 201. **MAP THEORY AND LAND NAVIGATION (1).** LEC. 1. Basic map reading including principles of land navigation, methods of expressing direction, use of the lensatic compass, map orientation, map classification, elevation, and relief.
- 202. **MILITARY POWER AND NATIONAL SECURITY (1).** LEC. 1. Examines the structure and operation of the national security system in the United States, contemporary issues concerning the military and its relationship to American society, and the nature and concept of military power.
- 203. **INTRODUCTION TO SMALL UNIT TACTICS (1).** LEC. 1. The functions, duties, and responsibilities of junior leaders; operations of the basic military team; and development of leadership potential through practical exercises.

ADVANCED PROGRAM**

Third Year (Junior)

Military Science III

MILITARY SCIENCE III (Pr., MS I & MS II or Basic Camp or equivalent training.)

- 301. **ADVANCED MAP THEORY, LAND NAVIGATION, AND ORIENTEERING TECHNIQUES (3).** LEC. 3, **LEADERSHIP LAB.** 1. Map and aerial photograph reading including marginal information, map and military symbology, use of the compass, and determining scale, distance, elevation, and relief.

302. **THEORY AND DYNAMICS OF MILITARY LEADERSHIP AND MANAGEMENT I (3). LEC. 3, LEADERSHIP LAB. 1.** Educational psychology of the instructional process and methods of military instruction to include lesson plan development and writing; familiarization with the various branches of the Army; the small unit leader's actions in planning, organizing, and executing small unit tactical operations.
303. **THEORY AND DYNAMICS OF MILITARY LEADERSHIP AND MANAGEMENT II (3). LEC. 3, LEADERSHIP LAB. 1.** ROTC Advanced Camp preparation to include orienteering, rappelling, and small unit operations.
305. **RANGER OPERATIONS, TACTICS, AND PHYSICAL CONDITIONING (1). LEC. (0), LAB. 2.** Mountaineering techniques, patrolling, land navigation, ambushes, hand-to-hand combat, small boat training, and two field exercises per quarter.

Fourth Year (Senior)

Military Science IV

401. **ORGANIZATION AND DYNAMICS OF THE COMBINED ARMS TEAM I (3). LEC. 3, LEADERSHIP LAB. 1.** Command and staff relationships and functions; organization, mission, and functions of Army divisions; capabilities and employment of combat, support, and service support forces; organization/tailoring of forces for combat.
402. **ORGANIZATION AND DYNAMICS OF THE COMBINED ARMS TEAM II (3). LEC. 3, LEADERSHIP LAB. 1.** Fundamentals of tactical operations; tactical employment of the company team; use of overlay orders, duties and responsibilities of unit commanders and operations officers in combat.
403. **ADVANCED MILITARY LEADERSHIP AND MANAGEMENT TECHNIQUES (3). LEC. 3, LEADERSHIP LAB. 1.** Army administration, training management, logistics, unit level operations; military justice; customs of the service. A culmination of all prior instruction as it relates to the responsibilities and obligations of an officer.
404. **LEADERSHIP LAB (0). 2 HR. LAB.** For advanced course Military Science students not enrolled in ROTC during a quarter because of leave of absence or who have completed all required classroom instruction.

*Basic Program students must complete a total of six courses to be eligible for the Advanced Program. The following courses may be substituted for any of the Basic Program courses: PE 130, Jogging; PE 133, Orienteering; PE 139, Wilderness Skills; and PE 162, Rifle Marksmanship. All members of the University Rifle Team should enroll in PE 362, Varsity Rifery every quarter in which they are active with the team. All members of the ROTC Ranger Company should enroll every quarter in MS 305, Ranger Operations, Tactics, and Physical Conditioning. HY 309, Military History of the U.S. may be taken in lieu of MS 202, Military Power and National Security.

**Members of the ROTC Ranger Company should enroll every quarter in MS 305, Ranger Operations, Tactics, and Physical Conditioning.

Music (MU)

Professors Hinton, Head, Moore, Rosenbaum, Tamblin, and Walls
Associate Professors Bennett, Howard, Liverman, L. Morgan, Timberlake, Smith and Vinson
Assistant Professors Alexander, C. Gossett, Greenleaf, J. Morgan, Richardson, Smith, and Stephenson
Instructors Mayfield, Preston, S. Gossett, and Fansler
Adjunct Assistant Professor Kendrick

100. **MUSIC CONVOCATION (0).** All quarters. Required of all music students each quarter. Performance & lectures by faculty, guest artists, and students. Music & music education majors are expected to perform at the teacher's discretion and in accordance with departmental rules.
- 131-132-133. **MATERIAL AND ORGANIZATION OF MUSIC (5-5-5).** A systematic study of harmony, counterpoint, form and style through the literature of music.
- 211-212. **SERVICE PLAYING (1).** Hymn playing, modulation, selected anthems and oratorio selections, simple improvisation and transposition.
- 231-232-233. **MATERIAL & ORGANIZATION OF MUSIC (5-5-5).** Pr., 133. Continuation of the study of harmony, counterpoint, form and style in music.
- 251-252-253. **SURVEY OF MUSIC LITERATURE (1-1-1). LEC. AND LAB. 3-3-3.** Presentation of instrumental solo, opera and symphonic music, acquainting the student with musical compositions and composers with emphasis on music literature of the past three centuries.
311. **LITURGIES (3).** Liturgical worship service of Roman Catholic and Protestant churches, plus non-liturgical forms of other Protestant denominations.
312. **HYMNOLOGY (3).** The musical significance of hymns of the Christian church from the earliest times to the present.
- 331-332-333. **MATERIALS AND ORGANIZATION OF MUSIC (5-5-5).** Pr., 233. Continuation of second year systematic study of harmony, counterpoint, form and style through the literature of music.

- 337-338-339. MODERN HARMONY I, II, III (3-3-3).** Pr., 233. Twentieth century harmonic devices. An integrated approach to understanding contemporary writing with emphasis on original work and analysis of the principal departments from "traditional" harmony.
- 351-352-353. MUSIC HISTORY I-II-III (3-3-3).** Development of music from early times to the present day. Lectures, recorded examples, readings.
- 361-362-363. CONDUCTING I-II-III (3-1-1).** Pr., MU 133, I. Elementary basic baton techniques and introduction to score reading. II. Choral conducting. Elementary course in choral score reading and conducting choir and glee clubs. III. Instrumental conducting. Elementary course in instrumental score reading and conducting band, orchestra and instrumental ensembles.
- 371. INTRODUCTION TO MUSIC (3).** Open to Elementary Education and Family and Child Development Majors only. The understanding of music including an explanation of basic terms, notations, rhythm, tonal system, vocal and piano score readings.
- 409. MARCHING BAND TECHNIQUES (3).** Fundamental methods and procedures of the Marching Band.
- 414. CARE AND REPAIR OF MUSICAL INSTRUMENTS (1), LEC. 1, LAB. 3.** Pr., senior standing. Selection, care and repair of woodwind, brass and string instruments with emphasis on adjustments which should be made by the instrumental director.
- 415. ORGAN LITERATURE AND DESIGN (3).** Survey of organ literature correlating the forms of compositions and types of organs for which the music was written.
- 416. CHURCH MUSIC SEMINAR (3).** Pr., MU 311, 312, 361, 362, 415, or 422, or COI. The processes of establishing a complete Church Music program. Supervised directing of choral ensemble.
- 434-435-436. MUSIC COMPOSITION I-II-III (3-3-3).** Pr., 233. Analysis, study, and writing of musical compositions in small, compound, and larger musical forms with emphasis on both stylistic and individual creative writing.
- 442. VOCAL PEDAGOGY (3).** For prospective voice teachers. An intensive study of the materials and methods of voice training. Classification and analysis of teaching repertoire.
- 443. STRING PEDAGOGY (3).** Mechanics of stringed instruments. Teaching methods, schools, and systems. Teaching literature and repertoire. For either violin, viola, cello, string bass or harp.
- 444. INSTRUMENTAL PEDAGOGY (3).** Mechanics of brass or woodwind instruments. Teaching methods and repertoire with emphasis on solo instrumental literature.
- 445. THEORY PEDAGOGY (3).** Required of seniors majoring in theory and composition. Designed to present the problems of sight-singing, rhythmic dictation, melodic and harmonic dictation, and part writing from a pedagogical viewpoint.
- 447-448-449. PIANO PEDAGOGY (3-3-3).** For prospective piano teachers. Teaching methods for beginners in private and group instruction. The intermediate and advanced student. Analysis of teaching repertory. Observation and practical experience.
- 452. VOCAL LITERATURE (3).** Pr., junior standing. Vocal literature from Elizabethan time to the present, including representative European and American repertoire.
- 454. INSTRUMENTAL LITERATURE (3).** Pr., junior standing. Analysis and study of orchestral scores and parts from the classic, romantic and modern literature.
- 455. OPERA LITERATURE (3).** Pr., junior standing. Vocal music of the opera from the Baroque to the present time.
- 457-458-459. KEYBOARD LITERATURE (1-1-1).** Pr., junior standing. Masterwork for keyboard from the Baroque Period to the present.

ADVANCED UNDERGRADUATE AND GRADUATE

- 522-523-524. THEORY REVIEW (3-3-3).** No credit for Applied Theory Composition or Pedagogy Majors. Harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.
- 537-538-539. ORCHESTRATION I-II-III (3-3-3).** Pr., MU 233. Ranges, notation, and characteristics of orchestral instruments. Exercises in arranging for combinations of string and wind instruments. Theory and practice of orchestration for full orchestra.
- 553. CHORAL LITERATURE (3).** Pr., junior standing. Chronological study of choral music from the Middle Ages to the present including opera, and oratorio with detailed examination of representative works.

GENERAL ELECTIVE COURSES

- 201. FUNDAMENTALS OF MUSIC (3).** Music primarily to develop functional piano skills, sight-reading, rhythm and melodic skills.
- 372. HISTORY OF JAZZ (3).** The growth of Jazz from its African and European roots to current experimentation.
- 373. APPRECIATION OF MUSIC (3).** May not be taken for credit by Music Majors or Minors. Outstanding composers and compositions. No previous music training required; an orientation in the art of listening.
- 374. MASTERPIECES OF MUSIC (3).** May not be taken for credit by Music Majors or Minors. Representative musical works of each great period of musical history. No previous music training required.
- 477-478-479. MUSIC ARRANGING (3-3-3).** By consent. Project course in arranging various combination from quartet to symphonic band, and arranging for solo and choral groups.

GROUP PERFORMANCE COURSES

- 121-122-123. UNIVERSITY SINGERS (1 HOUR CREDIT PER QUARTER).** May be taken with or without credit. A select choral ensemble for study and performance of madrigals, pop music, show tunes, and choral music of the jazz idiom. Open to any Auburn student by audition only.
- 124-125-126. CONCERT BAND (1 HOUR CREDIT PER QUARTER).** Members of the Band are selected during the first week of each quarter. A minimum of 4 rehearsal hours per week is required, with extra rehearsals scheduled as necessary. Band members are required to be present at all rehearsals and all public performances. Students enrolled in Concert Band will have the drill portion of Basic Military Training waived. (May be taken with or without credit.)
- 127-128-129. ORCHESTRA (1 HOUR CREDIT PER QUARTER).** Members of the symphonic orchestra are selected by try-outs during the first week of each quarter. (May be taken with or without credit.)
- 130. JAZZ LABORATORY BAND (1).** A musical ensemble for the study and performance of music relating to the jazz idiom. By audition only.
- 221-222-223. CHORAL UNION (1 HOUR CREDIT PER QUARTER).** Open to any Auburn student by consent of choral director. (May be taken with or without credit.)
- 224. MARCHING BAND (1 HOUR CREDIT PER QUARTER).** Fall Quarter only. Provides music for athletic contests and half-time shows at football games, various parades, pep rallies, and other campus and off-campus events. During the fall quarter, will rehearse a minimum of 6 hours per week. Physical Education may be waived for members of the Marching Band. In addition, students will have the drill portion of basic military waived when enrolled in Marching Band. See Band Director for details. (May be taken with or without credit.)
- 227-228-229. OPERA WORKSHOP (1 HOUR CREDIT PER QUARTER).** Open to all students interested in opera, including performance, stage-craft, make-up, conducting, and coaching. A minimum of three hours per week rehearsal or stage-craft is required with extra time scheduled as necessary. (May be taken with or without credit.)
- 321-322-323. CONCERT CHOIR (1 HOUR CREDIT PER QUARTER).** CONCERT CHOIR is a mixed chorus for study and performance of serious choral literature; open to any Auburn student by audition only. (May be taken with or without credit.)
- 324-325-326. MUSIC ENSEMBLE (1 HOUR CREDIT PER QUARTER).** COI. Primarily for advanced musicians for the study and performance of musical compositions for small instrumental and vocal groups. A minimum rehearsal of three hours per week required. (May be taken with or without credit.) Includes brass, woodwind, percussion, piano & harp ensembles.
- 327. PIANO ENSEMBLE (1 HOUR CREDIT PER QUARTER).** Study through performance of the ensemble literature for keyboard. May be repeated for credit.

Applied Music

Individual instruction is available in voice, piano, organ, strings, woodwinds, harp, brass and percussion. One 1 hour lesson or two half-hour lessons per week.

Students desiring study in applied music must be approved by the Head of the Department of Music before entrance into the course.

- 080. APPLIED MUSIC (0).** May be repeated. Individual instruction in instrumental or vocal areas. Rudimentary practice as related to each discipline.
- 181-182-183. APPLIED MUSIC (3-3-3).**
- 281-282-283. APPLIED MUSIC (3-3-3).**
- 381-382-383. APPLIED MUSIC (3-3-3).**
- 481-482-483. APPLIED MUSIC (3-3-3).** Individual instruction in instrumental or vocal areas. For Bachelor of Music majors only.
- 184-185-186. APPLIED MUSIC (1-1-1).**
- 284-285-286. APPLIED MUSIC (1-1-1).**
- 384-385-386. APPLIED MUSIC (1-1-1).**
- 484-485-486. APPLIED MUSIC (1-1-1).** Individual instruction in instrumental or vocal areas.
- 187-188-189. APPLIED MUSIC (1-1-1).**
- 287-288-289. APPLIED MUSIC (1-1-1).**
- 387-388-389. APPLIED MUSIC (1-1-1).**
- 487-488-489. APPLIED MUSIC (1-1-1).** Individual instruction in instrumental or vocal areas. For students in Elementary and Secondary Education, all music minors, and applied music electives.
- 660. APPLIED MUSIC (3-3-3).**

The amount of credit in Applied Music is based on the following practice schedule:

- 1 cr. hr.—5 hours weekly practice
- 3 cr. hrs.—15 hours weekly practice.

Applied Music Fees Per Course (Per Quarter) . . . \$35.00

This additional fee to be paid at the time of registering for each Applied Music Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.

Class Instruction in Applied Music

The Music Department offers a number of classes in Applied Music open to Music Majors and Minors and to regularly registered college students who have had previous music training. These classes meet two hours per week and carry one hour credit.

- 104-105-106. PIANO CLASS (1-1-1). (2-2-2 LEC. AND LAB.)** Class instruction and practice in the rudiments of music as applied to piano playing.
- 107-108-109. VOICE CLASS (1-1-1). (2-2-2 LEC. AND LAB.)** Class instruction and practice in the rudiments of music as applied to voice.
- 110-111-112. STRING INSTRUMENTS CLASS (1-1-1). (2-2-2 LEC. AND LAB.)** Class instruction and practice in the rudiments of music as applied to violin, viola, cello and contrabass playing.
- 113-114-115. BRASS INSTRUMENTS CLASS (1-1-1). (2-2-2 LEC. AND LAB.)** Class instruction and practice in the rudiments of music as applied to trumpet, trombone and other brass instruments.
- 116-117-118. WOODWIND INSTRUMENTS CLASS (1-1-1). (2-2-2 LEC. AND LAB.)** Class instruction and practice in the rudiments of music as applied to clarinet, oboe, bassoon, flute and other woodwind instruments.
- 119. PERCUSSION INSTRUMENTS CLASS (1). (2 LABS.)** Class instruction and practice in the rudiment of music as applied to percussion instruments: drums, bells, cymbals, triangle, tympani, etc.

ADVANCED UNDERGRADUATE AND GRADUATE

- 522-523-524. THEORY REVIEW (3-3-3).** Pr., senior standing and departmental approval. No credit for Applied, Theory-Composition, or Pedagogy majors. A review of the harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

GRADUATE

- 600-601-602. ADVANCED INSTRUMENTAL AND CHORAL CONDUCTING (2-2-2).** Laboratory for development of skills relating to the performance of traditional and modern works. Emphasis on score reading and analysis. Participation in an approved instrumental or choral ensemble is required.
- 603. BRASS INSTRUMENTS TECHNIQUES (1). LEC. 1, LAB. 3.** Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments. Participation in an approved instrumental organization is required. May be repeated for a maximum of 3 hours credit.
- 604. WOODWIND INSTRUMENTS TECHNIQUES (1). LEC. 1, LAB. 3.** Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on woodwind instruments. Participation in an approved instrumental organization is required. May be repeated for a maximum of 3 hours credit.
- 605. PERCUSSION INSTRUMENTS TECHNIQUES (1). LEC. 1, LAB. 3.** Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on percussion instruments. Participation in an approved instrumental organization required. May be repeated for a maximum of 3 hours credit.
- 606. MUSIC IN THE ARTS (4).** Music in relation to architecture, the plastic arts, and poetry.
- 607. CHORAL LITERATURE OF THE CLASSIC, ROMANTIC AND MODERN PERIODS (4).** The styles, forms, and performance practices of choral music from the Classic, Romantic and Modern periods, working primarily with scores of representative works. Participation in an approved choral organization is required.
- 608. CHORAL ARRANGING (4).** Pr., departmental approval. Advanced Arranging for various choral combinations. Participation in an approved choral organization is required.
- 609. SEMINAR IN 20TH CENTURY MUSIC (3-3-3).** Pr., departmental approval. Analysis and comparison of representative works of principal composers of the first half of the 20th century. Specific works chosen for each quarter. (May be repeated for a maximum of 9 hrs. credit.)

610. **BAND ARRANGING (4).** Pr., departmental approval. Advanced arranging for various band organizations. Participation in band is required.
611. **ORCHESTRAL ARRANGING (4).** Pr., departmental approval. Advanced arranging for various orchestral organizations. Participation in orchestra is required.
612. **ACOUSTICS IN MUSIC (3).** Pr., departmental approval. The physics of sound as related to music.
634. **MUSIC HISTORY SEMINAR (2).** Pr., departmental approval. Different aspects of the history of music. Specific research areas chosen each quarter. May be repeated for a maximum of 6 hrs. credit.
644. **REPERTOIRE SEMINAR (2).** Pr., departmental approval. Music literature in the student's major area through analysis & performance. May be repeated for a maximum of 6 hrs. credit.
- 650-651-652. **TECHNIQUES OF PRIVATE INSTRUMENTAL INSTRUCTION (2-2-2).** Pr., departmental approval. Analysis of teaching and supervised teaching.
- 653-654-655. **TECHNIQUES OF PRIVATE INSTRUCTION IN VOICE (2-2-2).** Analysis of teaching and supervised teaching.
660. **INDEPENDENT STUDY IN APPLIED MUSIC (3).** Pr., departmental approval. Advanced private study and public performance each quarter. May be repeated for credit not to exceed 12 hours.
- 681-682-683. **INDEPENDENT STUDY IN (A) COMPOSITION, (B) ANALYSIS (2-3, 2-3, 2-3).** Pr., departmental approval.
697. **QUALIFYING RECITAL.**

Naval Science (NS)

111. **ORIENTATION TO THE NAVY AND MARINE SCIENCES (1).** LEC. 1, LAB. 2. Fall. Introduction to basic areas of Naval Science including such subjects as: uniforms and insignia, military courtesy, discipline, components and supporting elements of the Navy, logistics, communications, security, Naval Intelligence, oceanographic research.
- 112-113. **NAVAL SHIPS SYSTEMS I & II (2-2).** LEC. 2, LAB. 2. I Winter, II Spring. Principles of ship design, constr., and stability. Study of impaired stability and damage control. Shipboard auxiliary systems, basic electricity, intro. to thermodynamics and steam cycle as applied to Naval propulsion systems. Advanced propulsion and ship design including nuclear and gas turbine engines.
211. **SEAPOWERS AND MARITIME AFFAIRS (2).** LEC. 2, LAB. 2. Fall. A seminar course dealing with broad principles, concepts, and elements of seapower and maritime affairs with application to the United States and other world powers.
- 212-213. **NAVAL WEAPONS I & II (2-2).** LEC. 2, LAB. 2. I Winter, II Spring. Introduction to weapons systems through a study of fund. principles of sensor, tracking, computational and weapons delivery subsystems. Missile and underwater battery systems, practical applic. of various systems.
- 311-312. **NAVIGATION I & II (3-3).** LEC. 3, LAB. 2. I Fall, II Winter. The theory and principles of piloting involving the use of visual and electronic aids. The theory, principles and procedures of celestial navigation.
313. **NAVAL OPERATIONS (3).** LEC. 3, LAB. 2. Spring. Navy tactical formations and dispositions, relative motion. Rules of the Road, maneuvering board, communications, and tactical plots are analyzed.
- 321-322-323. **EVOLUTION OF THE ART OF WAR (2-2-2).** LEC. 2, LAB. 2. Fall, Winter, Spring. Forms of warfare practices to identify historical continuity and change in the evolution of warfare. Demonstrates concepts of strategy, examine great captains and military organizations of history to discover ingredients of their success and explore the impact of historical precedent and technological change on politico-military thought and action.
- 411-412-413. **PRINCIPLES OF NAVAL ORGANIZATION AND MANAGEMENT. (3-3-3).** LEC. 3, LAB. 2. Fall, Winter, Spring. Various tools and methods of leadership. The UCMJ from the division officer's perspective. Naval personnel administration, materiel mgt., and correspondence.
- 421-422-423. **AMPHIBIOUS WARFARE (2-2-2).** LEC. 2, LAB. 2. Fall, Winter, Spring. Amphibious warfare prior to WW II through Korean conflict; definitions of concept, examination of doctrinal origins, evolution of amphib warfare and tactics and techniques, and the current structure of the Fleet Marine Force and its equipment.

Nutrition (NN)

(Interdepartmental Graduate Program)

651. **NUTRITION I. THE MACRO NUTRIENTS (5).** Pr., ADS-CH 519, ZY 524. The interrelationships among the energy-furnishing and structural nutrients, including carbohydrates, lipids and proteins. The digestion, absorption, transport and metabolism of these nutrients.
652. **NUTRITION II. THE MICRO NUTRIENTS (5).** A continuation of NN 651 with emphasis on the role of vitamins and minerals. A study of the interrelationships of nutrients and hormones. Effects of excesses and deficiencies on the organism.

553. **NUTRITION III. ASSESSMENT OF NORMAL AND ABNORMAL NUTRITIONAL STATES (5).** A continuation of NN 652, with emphasis on assessment of nutritional status of man and animals including an evaluation of standards, the human nutrition survey, clinical problems in nutrition, and hereditary and other disorders in metabolism.
554. **EXPERIMENTAL NUTRITION (5). LEC. 2, LAB. 6.** Pr., ADS-CH 519 and BY 501. Acquaints the student with the animal feeding experiment as a basis for research in nutrition. Includes balance studies and proximate analysis.
555. **NUTRITION SEMINAR (1).** Required of all students in the interdepartmental program in Nutrition. Must be taken three quarters.
556. **DIRECTED READINGS IN NUTRITION (3-5).** The development of nutrition as a science and a critical analysis of the classic and current literature in nutrition.

Suggested courses offered in other departments. For related courses at 500 level; see departmental listings.

- ADS 607. **COMPARATIVE ANIMAL NUTRITION.**
- ADS 614. **MINERALS.**
- ADS 615. **RUMINANT NUTRITION.**
- ADS 641. **PROTEINS.**
- ADS 642. **LIPIDS.**
- ADS 643. **ENZYMES.**
- FAA 621. **FISH NUTRITION.**
- NF 624. **ADVANCED HUMAN NUTRITION I.**
- NF 625. **ADVANCED HUMAN NUTRITION II.**
- NF 626. **ADVANCED HUMAN NUTRITION III.**
- PH 610. **ADVANCED POULTRY NUTRITION.**
- VPH 601. **MEDICAL PHYSIOLOGY I.**
- VPH 602. **MEDICAL PHYSIOLOGY II.**
- VPH 638. **PHYSIOLOGY OF DIGESTION.**
- VPH 639. **SMALL ANIMAL NUTRITION.**
- ZY 646. **RENAL AND DIGESTIVE PHYSIOLOGY.**

Nutrition and Foods (NF)

Professor Fick, *Head*

Associate Professors Chastain and Clark

Assistant Professors Craig-Schmidt, Keith, and Svacha

Instructors Price, Strawn, and Walker

104. **PRINCIPLES OF FOOD PREPARATION (5). LEC. 3, LAB. 4.** Each quarter. Basic principles underlying the fundamental processes and standards of food preparation.
112. **NUTRITION AND MAN (3).** Each quarter. The fundamentals of nutrition and the influence of socio-economic and cultural patterns of man on fulfilling nutritional needs.
204. **MEAL MANAGEMENT (5). LEC. 4, LAB. 3.** Pr., NF 104 and 112. Each quarter. Planning of meals with emphasis on scientific principles of nutrition, aesthetic value, management of time and the food budget on various economic levels.
307. **SURVEY OF DIETETICS (2). LAB. 1, LEC. 3.** Role and professional conduct of dietitians in various institutions. Open only to students enrolled in the Coordinated Dietetics Program.
312. **CHILD NUTRITION (3). LEC. 2, LAB. 2.** Pr., NF 112. Application of nutrition in the development of the child from conception through adolescence.
318. **NUTRITIONAL BIOCHEMISTRY (5). LEC. 4, LAB. 3.** Pr., CH 203. Chemistry of carbohydrates, fats, proteins, vitamins, and minerals applied to human nutrition.
324. **FOOD PRESERVATION (3). LEC. 2, LAB. 2.** Food spoilage mechanisms and their prevention.
346. **FOOD SERVICE ORGANIZATION AND MANAGEMENT (5).** Pr., NF 204. Management principles, methods of control and personnel management related to quantify food service operations. Credit will not be given for both NF 346 and NF 356.
356. **FOOD SERVICE ADMINISTRATION (10). LEC. 5. CLINICAL EXPERIENCE 15.** Pr., NF 204. The processes of planning, organizing, directing, evaluating and controlling, applied to food service systems. Experiences in cooperating facilities.

358. **COMMUNITY AND FAMILY HEALTH (3).** LEC. 2, LAB. 2. Facilities, services and agencies within the community which affect health. Field trips.
362. **PROBLEMS IN COMMUNITY NUTRITION (3).** Pr., NF 112, or equivalent. Environmental factors that influence the nutritional level of people.
372. **FUNDAMENTALS OF NUTRITION (3).** LEC. 3. Pr., CH 203, BI 101. Principles of human nutrition and factors influencing food requirements.
382. **PRINCIPLES OF NORMAL NUTRITION I (5).** LEC. 3, LAB. 4. Pr., NF 318 or equivalent. Physiological and biochemical bases of nutrient needs of the healthy individual. Methods of assessing nutritional adequacy of the diet.
392. **PRINCIPLES OF NORMAL NUTRITION II (5).** LEC. 3, LAB. 4. Pr., NF 382. Continuation of NF 382.
404. **QUANTITY FOOD PREPARATION. (5).** LEC. 3, LAB. 4. Pr., junior standing and NF 204. Menu planning, preparation and sanitation in institutional service of food. Includes use, operation, and maintenance of equipment. Laboratory experience in university food service facilities. Credit will not be given for both NF 404 and NF 516.
408. **INDEPENDENT OR FIELD STUDY. 3 TO 8 CREDIT HOURS.** Laboratory or field experiences approved and supervised by a faculty member. May be repeated for a maximum of 8 credit hours.
432. **MEDICAL DIETETICS (10).** LEC. 5. **CLINICAL EXPERIENCE 15.** Pr., NF 392. Principles of nutrition related to disease. Open only to students enrolled in Coordinated Dietetics Program. Experiences in cooperating institutions.
436. **FOOD SERVICE SYSTEMS (5).** LEC. 4, LAB. 2. Pr., junior standing. Planning, organizing, directing, evaluating, and controlling the functions and operations of food service systems.
442. **ADVANCED DIETETICS, 15 credits, LEC. 4, Clinical Experience 33.** Pr., NF 432. Emphasis on current research in dietetics and its clinical application. Experience in cooperating facilities.
446. **CATERING (3).** LEC. 2, LAB. 3. Pr., NF 204. Types of catered food-service functions: planning, pricing, organization, management, equipment and service.

ADVANCED UNDERGRADUATE AND GRADUATE

502. **DIET THERAPY (5).** LEC. 4, LAB. 2. Pr., NF 392. Application of principles of nutrition to various periods of stress and as a therapeutic aid in treatment of disease.
516. **QUANTITY FOOD PREPARATION (10).** LEC 5. **CLINICAL EXPERIENCE 15.** Pr., junior standing and NF 204. Principles of menu planning, preparation and sanitation in institution food service. Use, operation and maintenance of food service equipment. Experience in cooperating facilities.
522. **COMMUNITY NUTRITION (10).** LEC. 5. **CLINICAL EXPERIENCE 15.** Pr., NF 392 or COI. Assessment of community nutritional status and methods used to effect change. Experiences in cooperating facilities.
564. **EXPERIMENTAL FOODS (5).** LEC. 2, LAB. 6. Pr., NF 104 and CH 203. Effects of variation of ingredients and treatments on quality characteristics of foods. Nutrition problems and practices that exist in a modern society.
572. **NUTRITION AND SOCIETY (5).** Pr., satisfactory course in nutrition and COI. Environmental practices that exist in a modern society. Credit will not be given for both NF 522 and NF 572.
578. **MODERN VIEWS OF NUTRITION (3).** Pr., satisfactory course in nutrition. Current concepts in nutrition and related fields.
582. **TEACHING NUTRITION TO CHILDREN IN SCHOOLS, (3).** Pr., one nutrition course and junior standing. Methods for teaching nutrition principles and motivating changes in food habit of students in grades K-12. Focuses on nutrition education research as well as specific activities and objectives for various age groups.
588. **INTERNATIONAL NUTRITION (3).** Pr., satisfactory course in nutrition. Nutritional status of world population and local, national, and international programs for improvement.
592. **NUTRITION IN THE LIFE CYCLE (5).** Pr., NF 392 and junior standing. Metabolic and clinical approach to nutrition throughout the life cycle with emphasis on groups for whom nutrition is more crucial.

GRADUATE

601. **SEMINAR IN NUTRITION AND FOODS (1-5).** Each quarter. May be taken more than one quarter for a maximum of 5 credit hours.
605. **METHODS OF RESEARCH IN HOME ECONOMICS (3).** Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Nutrition and Foods.
609. **SPECIAL PROBLEMS IN NUTRITION AND/OR FOODS. CREDIT TO BE ARRANGED (2-5).** Pr., COI. May be taken more than one quarter.
620. **ADVANCED FOODS I (5).** Pr., NF 564 or equivalent. Food quality assessment and chemistry of carbohydrates in foods.

621. **ADVANCED FOODS II (5).** Pr., NF 564 or equivalent. Chemistry of fats and proteins in foods.
622. **PROBLEMS IN FOOD PRESERVATION (5).** Pr., BY 220 or 300. Various problems which grow out of advanced study of preservation of foods. These problems are subjects for minor research.
623. **READINGS IN NUTRITION AND/OR FOODS (5-10).** Pr., NF 382, CH 203. A critical survey of current literature. May be taken more than one quarter.
624. **ADVANCED HUMAN NUTRITION I (5).** Pr., NF 392, 318, or equivalents. Carbohydrates, fats and proteins. Consideration will be given to the biochemical and physiological functions of these nutrients and their interrelationships in human nutrition.
625. **ADVANCED HUMAN NUTRITION II (5).** Pr., NF 392, 318, or equivalents. Vitamins and minerals. Consideration will be given to the biochemical and physiological functions and interrelationships of these nutrients in human nutrition.
626. **ADVANCED HUMAN NUTRITION III (5).** Pr., NF 624 and 625, or equivalents. Assessment of human nutritional status. Dietary, biochemical and clinical methods of appraisal, and programs for improvement of status.
628. **RESEARCH METHODS IN NUTRITION (5).** A course designed to acquaint graduate students with modern laboratory techniques used in Human Nutrition Research.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.** Required of all students under the Thesis Option in any field.

Pharmaceutical Sciences (PY)

Professors Williams, *Acting Head*, Coker, Kochhar, and Wilken
Associate Professors Beebe, Belmonte, Clark, Darling and Hamrick
Assistant Professors Born and Ravis
Instructor Davidson

301. **PHARMACEUTICS I (5).** LEC. 4, LAB. 3. Pr. or coreq., PCS 260. Introduction to the prescription, pharmaceutical mathematics, dosage forms, pharmaceutical compounding necessary to the modern practice of pharmacy.
302. **PHARMACEUTICS II (5).** LEC. 4, LAB. 3. Pr., PY 301. Development of a basic knowledge of dosage forms and the principles involved in their formulation, design, preparation and evaluation.
316. **MODERN METHODS OF DRUG ANALYSIS (3).** LEC. 2, LAB. 3. Pr., CH 301. Theory and application of physical and chemical methods with special emphasis on the use of chromatography, instrumentation, and nonaqueous systems in the analysis of pharmaceutical products.
401. **PHARMACEUTICS III (5).** LEC. 3, LAB. 6. Pr., PY 302. Influence of formulation on the therapeutic activity of a drug in a dosage form, emphasizing effects of dosage forms on biological response, physiological factors which may affect the drug contained in the dosage form and the dosage form of the drug itself.
420. **MEDICINAL CHEMISTRY I (5).** Pr., CH 302, PY 316, ZY 561; coreq., PY 531. Relationship of biodynamic behavior to the chemical reactivity and physical properties of therapeutic agents. The mechanism of action, classification and structure-activity relationships of drugs in terms of their physical and chemical properties.
421. **MEDICINAL CHEMISTRY II (4).** Pr., PY 420, 531; coreq., PY 432, 532. A continuation of PY 420.
422. **MEDICINAL CHEMISTRY II (5).** Pr., PY 421, 532; coreq., PY 433, 533. A continuation of PY 421.
432. **CHEMICAL PHARMACOLOGY LABORATORY (1).** LAB. 3. Pr., PY 420, 531; coreq., PY 421 and 532. Laboratory exercises to demonstrate drug action, mechanism, and structure-activity relationship.
433. **CHEMICAL PHARMACOLOGY LABORATORY (1).** LAB. 3. Pr., 421, 532; coreq., PY 422 and 533. Continuation of PY 432.
434. **NUCLEAR PHARMACY (3).** LEC. 2, LAB. 3. Pr., PY 532. Use of radioisotopic material in the diagnosis and treatment of disease, including the nature of radiation and its interaction with biological material, measurement of radioactivity, preparation of dosage forms, safe handling of isotopes and legal requirements of radiopharmacy.
495. **SPECIAL PROBLEMS (1-5).** Pr., COI; may be repeated for a maximum of 8 credit hours.
510. **ADVANCED PHARMACEUTICS (3).** Pr., PY 401. Includes the basic physio-chemical and kinetic aspects which underlie the makeup and subsequent action of pharmaceutical dosage forms.
511. **ELEMENTS OF PHARMACEUTICAL MANUFACTURING (5).** LEC. 2, LAB. 9. Pr., PY 401. Manufacturing procedures, operation and principles. In the laboratory selected pilot scale production problems are carried out to completion including control and testing of finished products.
512. **INTRAVENOUS ADMIXTURES AND STERILE PREPARATIONS (3).** LEC. 2, LAB. 3. Pr., PY 401. Principles involved in the preparation of IV additives and sterile dosage forms in hospitals, clinics, and professional pharmacies.
531. **PHARMACOLOGY I (5).** Pr., PC 346 347 coreq., PY 420. Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion, and therapeutic and other uses of drugs.
532. **PHARMACOLOGY II (5).** LEC. 5. Pr., PY 420, 531; coreq., PY 421, 432. Continuation of PY 531.

533. **PHARMACOLOGY III (4), LEC. 4, Pr., PY 421, 532; coreq., PY 422, 433.** Continuation of PY 532.
535. **TOXICOLOGY.** Pr., PY 531. The etiology, pathology, symptomatology and therapy of the diseases induced by accidental exposure to the common agricultural, industrial, commercial and medicinal agents.
536. **CELLULAR PHARMACOLOGY (5), Pr., ZY 561, CH 302.** Cytological basis of pharmacodynamics including metabolic energy transformation, protein synthesis, and cellular control systems as related to drug actions.
537. **FUNDAMENTALS OF BIONUCLEONICS (3), LEC. 2, LAB. 3, Pr., PS 206, COI and second professional year standing.** Theoretical and practical application of trace level radioactivity for research application to pharmacy and allied sciences.
538. **PHARMACEUTICAL METHODOLOGIES (5), LEC.2, LAB. 9, Pr., CH 302, ZY 561.** Research principles and techniques utilized in evaluation of drug action, analysis and usage.

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601. **PARENTERAL PREPARATIONS (5), LEC. 3, LAB. 6, Pr., PY 303 and COI.** Theory, preparation and testing of various medicinal preparations intended for injection into the body. Pharmaceutical principles are applied to problems of filtration, sterilization, isotonicity, hydrogen ion concentration and aseptic techniques.
602. **TABLET MANUFACTURE (5), LEC. 2, LAB. 9, Pr., PY 401.** Essentials in the manufacture, coating and evaluation of compressed tablets.
603. **PRODUCT DEVELOPMENT (5), LEC. 3, LAB. 6, Pr., PY 401.** Formulation, evaluation and control techniques as well as actual manufacture of products of pharmaceutical and cosmetic nature.
604. **PHARMACEUTICAL LITERATURE (1),** Literature searching techniques, services, abstracting and writing, designed for the beginning graduate student in the pharmaceutical sciences.
608. **ADVANCED BIOPHARMACEUTICS (5), LEC. 3, LAB. 6, Pr., COI.** The relationship between physical and chemical properties of a drug and its dosage forms and the biological effects elicited following administration together with the relevant pharmacokinetics.
610. **COLLOIDAL AND INTERFACIAL PHENOMENA (5), LEC. 4, LAB. 3, Pr., CH 508 or equivalent and COI.** Interfacial and colloidal phenomena of chemical, biological, and pharmaceutical significance.
- 620-621-622. **CHEMISTRY OF SYNTHETIC DRUGS (5-5-5), Pr., PY 422 or COI.** Historical background; pertinent literature, organic name reactions, nomenclature, relation of chemical structure and physical properties to biological activity, isosterism, metabolite antagonism, enzyme inhibition; and exhaustive consideration of the chemistry and biological activity of the various therapeutic classes.
- 623-624-625. **SYNTHESIS OF DRUGS (5-5-5), LEC. 2, LAB. 9.** Coreq. PY 620-621-622 or COI. Laboratory procedures in the synthesis of intermediates and representative compounds studied in PY 620-621-622.
- 626-627. **ANALYTICAL AND CONTROL METHODS (5-5), LEC. 3, LAB. 6, Pr., PY 316 or COI.** The principles and techniques of analysis as applied to the various therapeutic classes.
628. **STEROID CHEMISTRY (5), Pr., PY 620 or COI.** Structure, determination, chemistry, synthesis and structure relationships of steroids of pharmacological and pharmaceutical importance.
629. **ALKALOID CHEMISTRY (5), Pr., PY 620 or COI.** Structure determination, chemistry and synthesis of alkaloids with emphasis on the alkaloids of pharmacological and pharmaceutical importance.
630. **FORENSIC AND ANALYTICAL TOXICOLOGY (5), Lec. 3, Lab. 6, Pr., PY 535, PY 316 or equivalent.** The medicolegal aspects of drugs and chemicals commonly encountered by humans and the modern methods used in their separation and identification. (Changes in course title, prerequisite, credit and description.)
- 631-632. **PSYCHOPHARMACOLOGY (5-5), LEC. 4, LAB. 3, 3, Pr., PY 536.** Effect of neurotropic and psychotropic agents upon reverberatory circuits, chemical transmitters, neural amines, and metabolic energy systems; measures of rate of behavioral change; critique of behavioral screening techniques.
633. **BIOASSAY (5), LEC. 4, LAB. 3, Pr., MH 267 or an equivalent course in statistics.** Statistical basis for design of experiments and analysis of data in pharmacological quantitation.
637. **PHARMACOLOGY SEMINAR (1-3).** May be repeated for a maximum of 3 hrs. credit. Pr., graduate standing.
638. **TOXICOLOGY SEMINAR (1-3), Pr., graduate standing.** Students are expected to present reviews of current literature and case histories. This will be followed with discussion by students and faculty.
- 650-651. **ADVANCED TOXICOLOGY (5-5), LEC. 3-3, LAB. 6-6, Pr., PY 535.** Toxicological principles, testing procedures, legal requirement, mechanisms of action and treatment of medicinal, environmental and industrial toxicants. (Changes in prerequisite and course description.)
660. **HETEROCYCLIC MEDICINAL CHEMISTRY (5), Pr., COI.** The chemical nature and behavior of heterocyclic moieties which are either themselves of medicinal significance or are components possessing therapeutic properties.
680. **GRADUATE SEMINAR (1), Pr., admission to Graduate School.** Required of all pharmacy graduate students each quarter.
695. **SPECIAL PROBLEMS (2-5), Pr., COI.** May be repeated for a maximum of 8 hours.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Pharmacy Care Systems (PCS)

Professors Barker, Acting Head, Cooper
Associate Professors Gibson, Mikeal and Newton
Assistant Professors Pearson and Shell
Instructors Cochran and Felkey
Research Associate Stringer
Adjunct Assistant Professor Swensson

260. **HISTORY AND ORIENTATION (3).** LEC. 3. Pr., PPY or PY standing. Introduction to delivery of health care services with emphasis on the role of the profession of Pharmacy.
360. **PHARMACY CONVOCATION (6).** Third professional year standing. Professional topics discussed by visiting lecturers, faculty, and students.
461. **HOSPITAL PHARMACY I (3).** Pr., PY 302. The development of hospitals, their place in society, importance and place of pharmacy in hospitals, administrative and policy making aspects together with interdepartmental relationships.
462. **HOSPITAL PHARMACY LABORATORY (1).** LAB. 3. Pr., PY 401 and COI. Course may be repeated for a maximum of three credit hours. Hospital pharmacy experience is obtained in the environment of participating hospitals. Students are expected to furnish transportation for this elective course.
463. **HOSPITAL PHARMACY II (3).** Pr., PCS 461. The organization, staffing, services, legal requirements, and development of hospital pharmacy departments to provide drug use control, education, and research by hospital pharmacists.
464. **PHARMACY JURISPRUDENCE (5).** Pr., MN 310, 207, PY 421, PCS 467, PY 532. Basic legal and ethical principles of pharmaceutical patient care and their effect on the patient drug use process.
465. **PHARMACY OPERATING SYSTEMS (5).** LEC. 3, LAB. 6. Pr., PY 401, PCS 464, MN 207, 310. Methods of systems and decision analysis applied to problems of optimizing the use of money, equipment, drug products, information and personnel within community and institutional environments.
466. **ENVIRONMENT OF DRUG DELIVERY (3).** Pr., PCS 260. Basic political, legal, social, ethical and economic principles of delivering the drug component of health care to patients.
467. **DRUG LITERATURE AND STATISTICS (3).** LEC. 3. Coreq., PY 420, 531. Emphasis on how and where to find drug information; most useful current therapeutic and drug literature; design, statistical analysis and interpretation of clinical reports.
471. **PROFESSIONAL COMMUNICATIONS I (3).** LEC. 2, LAB. 3. Pr., SC 202. The nature, purpose and process of communication for the Health Professional. Interviewing, detailing, advertising, and patient counseling are covered along with patient education and information dissemination.
472. **PROFESSIONAL COMMUNICATIONS II (3).** LEC. 2, LAB. 3. Pr., PCS 471. Continuation of PCS 471.
495. **SPECIAL PROBLEMS (1-5).** Pr., COI; may be repeated for a maximum of 8 credit hours.
561. **DRUG DELIVERY SYSTEMS (5).** Pr., MN 207. Identifying patient drug therapy needs and the means of providing these needs in nursing homes, home health care agencies, health maintenance organizations, and similar institutions utilizing the services of a pharmacist in a consultant capacity.
562. **INTRODUCTION TO MEDICATION INFORMATION SYSTEMS.** Pr., MN 207. Computer principles and methods of retrospective review of drug indications, contraindications, warnings, precautions, adverse reactions, dosages and administration to determine conformance to Pharmaceutical Services Committee Standards.
563. **PUBLIC HEALTH (5).** LEC. 4, LAB 3. Pr., BY 302., PCS 467 or equivalent. Epidemiological study of diseases of man. A survey of the public health and preventive medicinal programs of federal, state, local and private agencies is included.

GRADUATE

609. **INSTITUTIONAL PHARMACY (5).** LEC. 4, LAB. 3. Pr., PC 446, PCS 461, and COI. Comprehensive presentation of the development, responsibilities, classification, organization and administration of the pharmacy in hospitals, nursing homes, etc., from the viewpoint of the administrative pharmacist. Provides a survey of the responsibilities of the director of pharmacy service in a hospital.
680. **GRADUATE SEMINAR (1).** Pr., admission to Graduate School. Required of all pharmacy graduate students each quarter.
681. **HOSPITAL PHARMACY ADMINISTRATION (3).** Pr., PCS 609 or COI. Administrative and policymaking procedures regarding hospital economics, planning, staffing, communications, directing, controlling, design of facilities and operations. Provides an understanding of the socio-economic aspects of hospital pharmacy practice and competence in selected administrative skills needed by administrative pharmacists.

682. **RESEARCH METHODS AND DESIGN IN HEALTH SCIENCES I (3).** Pr., BY 501 or equivalent or COI. Description and application of the scientific methods to research problems unique to the health care field, including problem formulation, operational definitions, hypotheses, validity, reliability, research design, data collection by observation, questionnaires, and interviews; cost effectiveness analysis, clinical drug investigations, critiquing research.
683. **RESEARCH METHODS AND DESIGN IN HEALTH SCIENCES II (3).** Pr., PCS 682. Design and analysis of research problems in the health care field. The role of operational definitions, concept and construct linkage, hypotheses, and control in causal or covering designs.
684. **MEDICATION INFORMATION SYSTEMS (3).** Pr., PCS 465 or COI. Design, control, and planning of information systems used to implement medication orders and manage the medication distribution system.
695. **SPECIAL PROBLEMS (2-5).** Pr., COI; may be repeated for a maximum of 8 credit hours.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Pharmacy, Clinical (PC)

Associate Professors Campagna, Head, Tanja, and Thomasson
Assistant Professor Janer

Adjunct Professors Boshell and Upham

Adjunct Associate Professors Garrett, Haynes, Himmelwright,

C. Jenkins, Lazarus, Lazenby, and Palacios

Adjunct Assistant Professors Alexander, R. L. Anderson, Burney,

Collins, Dempsey, Druhan, Fisher, Godsil, Henry, Herrick,

Herring, Holman, Hood, Hurd, P. Jenkins, Keith, Kent, Knight,

Lantoin, Lyman, McDuffie, Meadows, Montgomery, Payne,

Pino, Russell, M. Short, Strother,

Tibbets, Webb, and Woosley

Adjunct Instructors Abbott, R. W. Anderson, Batt, Henderson,

Jones, Main, Moulton, Nelson, Parker, Pittman, Sanchez, Scarborough, B. Short,

M. Turner, P. Turner, and Williams

346. **CLINICAL EVALUATION OF DRUG THERAPY (3).** LEC. 3. Pr., CH 302, ZY 561, coreq., PC 347. Examination of the use and interpretation of clinical laboratory test procedures as applied to monitoring therapy.
347. **HUMAN PATHOLOGY (5).** LEC. 5. Pr., ZY 561, CH 302, coreq., PC 346. The general mechanisms and language of disease. Special emphasis on pathogenesis of disease to include an understanding of the dynamic nature of disease.
361. **PHARMACEUTICAL TERMINOLOGY (2).** Pr., first professional year standing. Common terms and abbreviations used in the professional and scientific aspects of pharmacy and medicine.
447. **THERAPY OF DISEASE I (3).** LEC. 3. Pr., PY 420, 531, coreq., PY 421, 532. The combination of pathophysiology, clinical chemistry, pharmacology, biopharmaceutics, etc., for specific diseases. To be presented through use of actual case studies with emphasis on the role of the pharmacist in treatment of patient.
448. **THERAPY OF DISEASE II (3).** LEC. 3. Pr., PC 447, coreq., PY 422, 533. Continuation of PC 447.
449. **DRUG THERAPY IN CLINICAL PRACTICE (5).** LEC. 3, CLINICAL CONFERENCE 1, LAB. 6. Pr., PC 448, PY 533. A clinical clerkship involving the observation of drug effects in patients. Students monitor and evaluate drug action by participating in patient rounds and clinical conferences.
450. **AUTOTHERAPY (3).** LEC. 3. Pr., PC 448, PY 422, 533. Introduction to the triage function of the pharmacist. Evaluation of and response to patient illness complaints.
453. **PROFESSIONAL PRACTICE (3).** LEC. 1, LAB. 6. Pr., 3rd prof. year standing. COI. Placement of students in various pharmacy practice environments to increase knowledge of practice options.
456. **DRUG INFORMATION SERVICES (3).** Pr., PC 448, PCS 467. The collection, evaluation, sorting, filing, assimilation, and dissemination of drug information.
457. **DRUG INTERACTIONS (3).** Pr., PC 448, PY 422, 533. Mechanisms of drug interactions with other drugs, foods, endogenous materials and modifications of laboratory tests due to drugs.
459. **PRACTICE EXTERNSHIP (17).** Pr., third professional year standing. A structured externship experience in various practice environments, including hospital, community, and other settings.
460. **CASE STUDIES IN CLINICAL PHARMACY (3).** Pr., PC 448. Patient profiles for assessing rational drug therapy based on patient diagnosis, laboratory tests, hospital assessment, and ambulatory condition.
- 480-481-482. **PHARMACY CLERKSHIP (6-6-6).** LEC. 1, LAB. 39, 3-4 WEEKS. Pr., PC 459, coreq., PC 480-481-482. Any quarter by arrangement. Conferences and clinical rotations with training in patient assessment, rationale therapy, and drug consultations in various medical, surgical, and family medicine environments.
495. **SPECIAL PROBLEMS (1-3).** Pr., COI; may be repeated for a maximum of 8 credit hours.

GRADUATE

680. **GRADUATE SEMINAR (1).** Pr., admission to Graduate School. Required of all pharmacy graduate students each quarter.
695. **SPECIAL PROBLEMS (2-5 HOURS).** Pr., COI. May be repeated for a maximum of 8 hours.
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**

Philosophy (PA)

Professor Andelson

Associate Professors McKown, Head, Brown, Davis, and Pancheri

Assistant Professor Walters

202. **ETHICS AND SOCIETY (5).** Examines topics of contemporary moral concern from the standpoint of various ethical theories.
210. **INTRODUCTION TO PHILOSOPHICAL PROBLEMS (3).** An introduction to the methods of philosophical inquiry and an examination of selected philosophical topics.
211. **INTRODUCTION TO DEDUCTIVE LOGIC (3).** Principles of deduction; analysis of arguments; selected problems in logic.
212. **INTRODUCTION TO SCIENTIFIC REASONING (3).** Inductive techniques of hypothesis formation, and a discussion of such related problems in the theory of knowledge as perception, causation, and confirmation.
214. **INTRODUCTION TO ETHICS (3).** Surveys various schools of moral philosophy and examines types of moral theory.
216. **PHILOSOPHIES OF MAN (3).** Examines philosophical anthropology by surveying alternative theories of human nature.
218. **ETHICS AND THE HEALTH SCIENCES (5).** Topics such as contraception, abortion, and eugenics; human experimentation; truth in drugs and medicine; death and dying, and other health related issues in order to clarify relevant ethical considerations and to provide philosophical bases for decisions on right and wrong, good and bad, rights and responsibilities.
305. **AESTHETICS (5).** Examines theories of beauty and art from Plato to contemporary thinkers.
330. **PHILOSOPHY OF RELIGION (5).** Examines the nature of religion, religious language, religious knowledge, religious theories of man and evil, and examines arguments for the existence of God and the immortality of the soul.
333. **HISTORY OF PHILOSOPHY I. ANCIENT AND EARLY MEDIEVAL (5).** Surveys of philosophic thought from the Pre-Socratics through Aquinas, emphasizing Plato and Aristotle.
334. **HISTORY OF PHILOSOPHY II. LATE MEDIEVAL AND EARLY MODERN PHILOSOPHY (5).** Surveys philosophic thought from Occam to Kant emphasizing major thinkers.
335. **HISTORY OF PHILOSOPHY III. RECENT AND CONTEMPORARY PHILOSOPHY (5).** Surveys various representatives of the major philosophical trends during these periods.
370. **SYMBOLIC LOGIC (5).** From the propositional calculus through the logic of relations; selected logical problems.
380. **PRAGMATISM (5).** Emphasis on Peirce, James, and Dewey. Some philosophical issues examined from a pragmatic viewpoint.
401. **PHILOSOPHICAL FOUNDATIONS OF COMMUNISM (5).** Pr., junior standing. Examines the thought of Marx-Engels and its development in Kautsky, Bernstein, Lenin.
402. **EXISTENTIALISM (5).** Pr., junior standing. Selected works of such authors as Kierkegaard, Nietzsche, Sartre, Jaspers, and Heidegger.
425. **PHILOSOPHY OF MIND (5).** Pr., junior standing. Examines classical and modern texts on the phenomenology of consciousness and mind-body problems.
432. **PROCESS PHILOSOPHY (5).** Pr., junior standing. An examination of selected writings of Bergson, James, and Whitehead.
440. **CONTEMPORARY MARXISM (5).** Pr., junior standing. Examines the thought of Lukacs, Stalin, Merleau-Ponty, Sartre, Habermas, Marcuse, and others.
455. **METAPHYSICS (5).** Pr., junior standing. A critical analysis of such topics as monism and pluralism, freedom and determinism, realism and nominalism, and the mind-body problem.
460. **EPISTEMOLOGY (5).** Pr., junior standing. The origin, nature, kinds, and validity of knowledge; consideration of faith, intuition, belief, opinion, certainty, and probability.
470. **PLATO (5).** Pr., junior standing. Examines such topics as Plato's Methodology, epistemology, metaphysics, ethics, political theory.

475. **ARISTOTLE (5).** Pr., junior standing. Examines Aristotle's logic, epistemology, metaphysics, ethics, political theory, psychology.
482. **BRITISH EMPIRICISM (5).** Pr., junior standing. Examines seventeenth and eighteenth-century empiricism emphasizing Locke, Berkeley, Hume.
484. **CONTINENTAL RATIONALISM (5).** Pr., junior standing. Examines major themes in such thinkers as Descartes, Spinoza, Leibniz, Gassendi.
498. **READINGS IN PHILOSOPHY (1-10).** Pr., junior standing, a 3.25 average in relevant prior work either in philosophy or in related areas and consent of department head and instructor. Specific reading programs may be developed which pertain to a particular philosopher, period or problem. A paper and an examination will be expected. May be repeated for credit.

ADVANCED UNDERGRADUATE AND GRADUATE

504. **MODERN ETHICAL THEORIES (5).** Recent analyses of the meanings, presuppositions, and problems of ethical terms and judgments.
513. **PHENOMENOLOGY (5).** The phenomenological method and its application in the works of William James, Husserl, Heidegger, Sartre, and Merleau-Ponty.
515. **PHILOSOPHY OF SCIENCE (5).** Such topics as empirical meaning, verifiability, measurement, probability, causality, and determinism.
580. **ANALYTIC PHILOSOPHY (5).** Philosophical analysis in the twentieth century from G. E. Moore through the Oxford analysts.
590. **KANT AND TRANSCENDENTAL IDEALISM (5).** The philosophy of Kant in particular but also of the early Fichte and Schelling and of neo-Kantians.
591. **HEGEL AND ABSOLUTE IDEALISM (5).** The philosophy of Hegel in particular but also of the late Fichte and Schelling, of neo-Hegelians, and of Schopenhauer and other critics.
592. **PHILOSOPHY OF LAW (5).** The nature and function of law, including such topics as judicial reasoning, the ground of authority, natural law, legal responsibility, punishment, civil disobedience, and the relation of law to ethics and the behavioral sciences.

GRADUATE

650. **SEMINAR (1-10).** Pr., COI. The content will change for each quarter in any one calendar year. This will vary from movements of thought to an intensive study of one of the great thinkers such as Plato or Whitehead. May be repeated for credit.

Physical Science (PHS)

Associate Professors Ward and Simon

- 100-101. **INTRODUCTORY PHYSICAL SCIENCE (5-5). LEC. 4, LAB. 2.** An introduction to physics, chemistry, astronomy, and earth sciences for students in liberal arts, education, business, and non-science pre-professional curricula. The approach is primarily historical and cultural rather than quantitative, although adequate preparation is provided for those who will teach elementary school science.
101. **PHYSICAL SCIENCE FOR ELEMENTARY EDUCATION II (5). LEC. 4, LAB. 2.** Continuation of PHS 100.

ADVANCED UNDERGRADUATE AND GRADUATE

530. **MODERN CONCEPTS IN PHYSICAL SCIENCE I (5). LEC. 4, LAB. 3.** Pr., PHS 101 or PS 206, or COI, junior standing.* General physical science based on IPS materials designed to acquaint the student with the IPS approach.
531. **MODERN CONCEPTS IN PHYSICAL SCIENCE II (5). LEC. 4, LAB. 3.** Pr., PHS 101 or PS 206, or COI, junior standing.* A survey of physics topics using PSSC and Project Physics materials designed to acquaint the students with these approaches to high school physics.
532. **NUCLEAR SCIENCE FOR TEACHERS (5). LEC. 4, LAB. 3.** Pr., a course in general physics and preferably one in chemistry plus junior standing, junior or senior high school teacher, or approval of instructor.* A course in the fundamentals of atomic and nuclear structure, designed for junior and senior high school teachers, including the study of radioactivity and nuclear radiation, radiation detection, radiological safety, nuclear fission and fusion, nuclear power reactors and power generation, advantages and hazards of nuclear power reactors.

*Not available to graduate students in the areas of science or mathematics.

Physics (PS)

Professors Kribel, *Head*, Alford, Askew, Carr, Fromhold, and Latimer

Associate Professors Budenstein, Chen, Clothiaux, French, Fukai, Kinzer, Simon, and Ward

Assistant Professors Cooper, Murphree*, Pindzola*, Thaxton, and Williams
Instructor Knight

- 200. FOUNDATIONS OF PHYSICS (5).** The basic principles of mechanics, heat, light, sound, electricity and magnetism and selected topics. For students in agricultural and industrial arts education, industrial design, and home economics. Credit in PS 220 or 205 precludes credit for this course.
- 205-206. INTRODUCTORY PHYSICS I-II (5-5).** LEC. 4, LAB. 3. Pr., for PS 205, MH 160; for PS 206, PS 205. A two-quarter sequence covering topics in mechanics, fluids, heat, wave motion, sound, light, electricity, and magnetism. Quantitative as well as qualitative aspects of the subject are stressed utilizing algebra and trigonometry. Primarily for students in health and agricultural sciences, architecture, and other curricula not requiring technical physics.
- 210. PRINCIPLES OF MODERN PHYSICS (5).** LEC. 4, LAB. 3. Pr., PS 206. The fundamental principles of physics to current topics. Lecture discussions are extended and supplemented by laboratory experience. Subjects include relativity, atomic and nuclear phenomena, and radiation. Credit in PS 320 or 305 precludes credit in this course.
- 215. ASTRONOMY (5).** LEC. 4, LAB. 3. Open to non-science majors. The planet Earth and the solar system; the stars; theories of stellar evolution, galaxies and the expanding universe; modern cosmological theories. The laboratory emphasizes studies with the telescope.
- 220-221-222. GENERAL PHYSICS I-II-III (4-4-4).** LEC. 3, LAB. 3. Pr., for PS 220, MH 163 or concurrently; for PS 221, MH 264 or concurrently and PS 220; for PS 222, PS 221. A three-quarter sequence using calculus wherein topics in mechanics, fluids, wave motion, sound, thermodynamics, optics, electricity, and magnetism are covered in depth. The sequence serves as a foundation for students in science and engineering curricula.
- 241-242. GENERAL ASTRONOMY I-II (5-5).** LEC. 4, LAB. 3. Coreq., PS 205, 220, or 320. A two-course sequence for technical students.
- 300. ELECTRICITY AND MAGNETISM (4).** LEC. 3, LAB. 3. Pr., PS 222 or 206, MH 265. Basic study of capacitance, inductance, DC circuits, transient and steady state AC circuits; laboratory exercises emphasize electrical and magnetic measurements, with experimental verification of analytical solutions to practical problems.
- 301. ELECTROMAGNETISM (5).** LEC. 4, LAB. 3. Pr., PS 222 or 206, MH 501. Electrostatics, study of fields in dielectrics, magnetic forces and effects, electric and magnetic properties of matter, development of Maxwell's equations, electromagnetic wave propagation, and radiation. Selected laboratory exercises will examine the production, measurement, and interaction with matter of electric and magnetic fields.
- 302. ELECTRONICS (5).** LEC. 4, LAB. 3. Pr., PS 300, MH 265. Review of AC and DC circuits; theory of vacuum tubes and semiconductors; diodes as rectifiers and regulators, tube and transistor voltage and power amplifiers, feedback amplifiers and oscillators; pulse and digital circuits. Appropriate laboratory exercises form a part of the course.
- 303. OPTICS (5).** LEC. 4, LAB. 3. Pr., PS 301, MH 501, junior standing. Intermediate course in physical optics comprising wave motion, reflection, refraction, dispersion, origin of spectra, interference, diffraction, and polarization, with appropriate laboratory experiments.
- 304. APPLIED SPECTROSCOPY (5).** LEC. 4, LAB. 3. Pr., PS 222 or 210, MH 264. The more important concepts of the origin of spectra; a study of instruments and techniques of practical spectroscopy. Laboratory experiments designed to give students in both chemistry and physics a working knowledge of spectroscopy as a tool.
- 305. INTRODUCTION TO MODERN PHYSICS (5).** LEC. 4, LAB. 3. Pr., PS 222 or 206, MH 265. Introduction to relativistic kinematics and dynamics, particle aspects of electromagnetic interaction, wave aspects of material particles, structure of the hydrogen atom, many electron atoms, nuclear structure and reactions, and molecular and solid-state physics. Credit in PS 210 or 320 precludes credit in this course.
- 320. MODERN PHYSICS FOR ENGINEERS (3).** LEC. 3. Pr., PS 222, MH 264. Introduction to modern physics, including special relativity, Schrodinger wave mechanics, atomic and nuclear systems, elementary particles. Credit in PS 210 or 305 precludes credit in this course.
- 340. INTERMEDIATE MECHANICS (3).** Pr., PS 221, MH 265. Selected topics in mechanics including vector and coordinate kinematics and dynamics; free and driven damped harmonic oscillator; generalized coordinates and an introduction to Lagrange's equations.
- 412. SEMINAR IN MODERN PHYSICS (1).** Pr., senior standing. Library search, written reports, and oral presentation of a pertinent topic in modern physics.
- 490. SPECIAL TOPICS (1-5).** Pr., COI. Topics will vary as needed. They will include but will not be limited to such areas as: non-linear systems, gravitation, theory of waves, group theory, atomic and molecular processes, elasticity, fluid mechanics, and low temperature. May be taken for credit more than once.

*Temporary.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **MECHANICS I (5).** Pr., MH 265. Newtonian mechanics, linear oscillations, non-linear oscillation introduction to calculus of variations.
502. **MECHANICS II (5).** Pr., PS 501. Hamilton's principle and Lagrange's equations, central force motion, collisions, non-inertial frames, rigid body dynamics, vibrating systems.
503. **ADVANCED ELECTROMAGNETISM (5).** Pr., PS 301. Application of Maxwell's equations to radiation and the interaction of the electromagnetic field with matter.
504. **STATISTICAL THERMODYNAMICS (5).** Pr., PS 516, senior standing. Temperature, entropy, and chemical potential are developed from the principles of equilibrium quantum states. The Gibbs representation is introduced and applied to the development of equilibrium distribution functions. Quantum statistics is developed and applied to problems.
505. **NUCLEAR PHYSICS (5).** LEC. 4, LAB. 3. Pr., PS 305 or 320, MH 265. Nuclear radiations; transmutations; natural and artificial radioactivity; binding energy; nuclear forces; structure of the nucleus; nuclear fission and its applications. Appropriate laboratory experiments.
506. **ADVANCED LABORATORY I (2).** LAB. 6. Pr., PS 301 or 302, 305. Research oriented experiments will be selected in the areas of biophysics, plasmas, low temperature, high vacuum, wave propagation, nuclear and atomic spectroscopy, Mossbauer effect, nuclear magnetic resonance, transport in solids, Hall effect, mass spectrometry, advanced electronics, and other areas of current interest in research.
507. **ADVANCED LABORATORY II (2).** LAB. 6. Pr., PS 506. A continuation of PS 506.
508. **ADVANCED LABORATORY III (2).** LAB. 6. Pr., PS 507. A continuation of PS 507.
509. **INTRODUCTION TO REACTOR PHYSICS I (5).** LEC. 4, LAB. 3. Pr., PS 305 or 320, and MH 265. Brief account of nuclear physics; basic instrumentation; interaction of neutrons with matter; chain reactions; neutron diffusion; the bare homogeneous thermal reactor; lattice constants; reactor kinetics.
510. **INTRODUCTION TO REACTOR PHYSICS II (5).** LEC. 4, LAB. 3. Pr., PS 509. Homogeneous reactor with reflector; reactor control; power reactors; thermal aspects of reactor systems; design variables; radiation detection and measurement; shielding; radiation hazards.
513. **INTRODUCTION TO X-RAY CRYSTALLOGRAPHY (5).** LEC. 4, LAB. 3. Pr., PS 305, COI. Principles of crystallography, the reciprocal lattice, theory of x-ray diffraction, and the powder, laue, and diffractometer methods.
514. **ELECTRON MICROSCOPY (5).** LEC. 3, LAB. 6. Pr., PS 222 and MH 264. Electron optics; theory and operation of the electron microscope; techniques of mounting, replication and shadowing of specimen; electron diffraction, theory and interpretation of patterns.
- 515-516. **INTERMEDIATE MODERN PHYSICS I AND II (5-5).** Pr., MH 265, PS 305 or 320. Special theory of relativity; introductory quantum mechanics with applications to microscopic systems; Fermi-Dirac, Bose-Einstein statistics; and electronic bands in solids.
517. **INTRODUCTION TO BIOPHYSICS (5).** Pr., COI. The physics of biological systems, with emphasis on the cellular and subcellular levels, effects of light and high energy radiations, bio-electric phenomena, bio-energetics, etc.
519. **SCIENTIFIC INSTRUMENTATION (3).** LEC. 2, LAB. 3. Pr., PS 206, MH 162, COI. For advanced undergraduates and graduate students in the natural sciences. The course is directed to the selection and use of equipment normally used for lab experimentation in the scientific fields. Pertinent laboratory experiments will accompany the course.
521. **MODERN ELECTRONICS (5).** LEC. 3, LAB. 6. Pr., PS 302. Network theory and digital logic; state-of-the-art electronic devices; operational amplifiers; linear and digital integrated circuits; servo systems; selected topics in modern instrumentation.
525. **PRINCIPLES OF NUCLEAR ENERGY SYSTEMS (5).** Pr., PS 305 or 320 and MH 265 or COI. Fundamental aspects of nuclear energy systems including: nuclear properties of matter, the fission process, radiation, nuclear reactor and plant design, thermal aspects of nuclear reactors, reactor control, safety analysis, licensing, isotope power sources, space applications, and fusion.
535. **INTRODUCTION TO SOLID STATE PHYSICS (5).** Pr., PS 305 or 320, MH 264. Solid state phenomena including lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetic phenomena.
545. **PLASMA PHYSICS (5).** LEC. 4, LAB. 3. Pr., PS 303, and 305 or 320, COI or senior standing. Collision phenomena in gases, elementary processes, creation of ionized gas (plasma), interaction of plasma and fields, plasma heating, instabilities, radiation, man-made and natural applications.
560. **ASTROPHYSICS (5).** LEC. 4, LAB. 3. Pr., junior standing and MH 265, PS 215 or 242, PS 305 or 320. Astrophysics for students of science, engineering, and mathematics.
570. **HEALTH PHYSICS (5).** LEC. 4, LAB. 3. Pr., COI. Fundamental principles of radioactivity; instrumentation for detecting and monitoring radioactive nuclides; radiation effects on man; permissible radiation dosages; safe handling of radioactive substances; and shielding from various radiations.

GRADUATE

601. **ADVANCED DYNAMICS I (3).** Pr., PS 502. D'Alembert's principle; introduction to the calculus of variations; Hamilton's principle and Hamilton's equations; principle of least action.

602. **ADVANCED DYNAMICS II (3).** Pr., PS 601. Canonical variables and contact transformations; the Hamilton-Jacobi equation; action; angle variables; Poisson brackets; continuous systems.
603. **MECHANICS OF CONTINUOUS MEDIA (3).** Pr., PS 602. Introduction to theories of elasticity and fluids.
- 604-605-606. **THEORY OF ELECTRICITY AND MAGNETISM I-II-III (3-3-3).** Pr., PS 503 or EE 391, coreq., MH 607-608-609. Maxwell's formulation of classical electromagnetic theory. Includes electrostatics, magnetostatics, potential problems; electric currents, Maxwell's equations, electromagnetic waves, radiation theory, boundary value problems.
607. **PHYSICAL OPTICS (3).** Pr., PS 606. Application of Maxwell's equations to optical phenomena including Kirchhoff's formulation, propagation of electromagnetic waves in anisotropic media, double refraction, dispersion.
611. **PLASMA PHYSICS I (3).** Pr., PS 301, 502 or COI. Particle interactions and orbit theory, plasma kinetic theory, Boltzmann equation, transport phenomena, Fokker-Planck equation, plasma generation and diagnostics.
612. **PLASMA PHYSICS II (3).** Pr., PS 611 or COI. Wave phenomena in plasmas, free and forced plasma oscillations, waves in anisotropic plasmas, shock waves, plasma stability, beam-plasma interactions.
613. **PLASMA PHYSICS III (3).** Pr., PS 612 or COI. Radiation processes in plasmas without magnetic fields, bremsstrahlung of transverse waves, cyclotron radiation and echoes, scattering of transverse waves.
614. **PLASMA SPECTROSCOPY (3).** Pr., PS 606, 642, or COI. Classical and quantum radiation theory, line oscillator strengths, line-broadening, equilibrium relations, temperature and density measurements.
628. **STATISTICAL MECHANICS I (3).** Pr., PS 502, 504. Theory and applications of equilibrium statistical mechanics: relation of statistical mechanics to thermodynamics.
629. **STATISTICAL MECHANICS II (3).** Pr., PS 628. Statistical mechanics of quantum mechanical systems. Introduction to non-equilibrium statistical mechanics. Boltzmann transport equation. Fluctuations and dissipation.
630. **MODERN PHYSICS FOR HIGH SCHOOL TEACHERS (5). LEC. 4, LAB. 3.** Pr., MH 587 or equivalent. Physics since 1890 including: structure of matter; atomic and molecular spectra; X-rays, natural and induced radioactivity; nuclear fission and fusion; and cosmic rays.
632. **SPECIAL THEORY OF RELATIVITY (3).** Pr., PS 602, 604. Relativistic mechanics, covariant formulation of Maxwell's field equations, Lagrangian and Hamiltonian formulation of fields.
635. **SOLID STATE PHYSICS I (3).** Pr., PS 535, 643. Electrons in a perfect crystal lattice, description of the symmetry properties of solids, Brillouin zones.
636. **SOLID STATE PHYSICS II (3).** Pr., PS 635. Cohesive energy, interaction of electrons with electromagnetic radiation, interactions between electrons and the crystal lattice.
637. **SOLID STATE PHYSICS III (3).** Pr., PS 635. Magnetic properties of solids; para-, dia-, ferro-, and antiferromagnetic effects. Resonance experiments, optical properties of solids.
639. **DIRECTED READING IN PHYSICS (2).** Pr., COI. May be repeated for credit.
- 641-642-643. **QUANTUM MECHANICS I-II-III (3-3-3).** Pr., for PS 641, 502; for 642, 641, and for 643, 642. Duality of particles and waves; uncertainty principle; wave functions and Schrödinger's equation; one-dimensional states; operator and matrix formalism; bound states problems; angular momentum; stationary and time-dependent perturbation theory; spin and identical problems; scattering theory; atoms, molecules and solids. Interaction of radiation with matter.
- 644-645. **ADVANCED QUANTUM MECHANICS I-II (3-3).** Pr., PS 643 or COI. Dirac electron; field quantization; interactions; Feynmann diagrams; dispersion relations.
650. **BIOLOGICAL EFFECTS OF RADIATION (5). LEC. 3, LAB. 6.** Pr., ZY 310 or ZY 525 or equivalent, PS 205 and 206 or equivalent, or COI. (Same as ZY 650.) Summer. An introduction to radiation biology including radiation physics; radiation detection equipment; dosimetry; the effects of ionizing radiation at molecular, cellular, organ, and organismic levels, and radioprotection. Credit in ZY 650 precludes credit in PS 650.
653. **SEMINAR IN PHYSICS (2).** Pr., COI. May be repeated for credit.
655. **SPECIAL TOPICS IN THEORETICAL PHYSICS (3).** Pr., COI. Choice of topic will vary but will include: relativity theory, group theory, atomic and molecular structure, elasticity; fluid mechanics; quantum field theory; low temperature physics. May be repeated for credit.
661. **NUCLEAR STRUCTURE (3).** Pr., PS 505, PS 643. Selected topics on properties of nuclei.
662. **NUCLEAR PROCESSES (3).** Pr., PS 661. Radioactive decay, nuclear reactions.
- 671-672. **ADVANCED SOLID STATE THEORY I-II (3-3).** Pr., PS 637. Quantum field theory methods of solving the many-body problem, second quantization, statistical mechanics in occupation number formalism, Feynmann diagrams and infinite-order perturbation theory, Green's function propagators, "dressed" interactions and quasi-particles, many-body effects in metals, Fermi liquid theory, present-day theories of super-conductivity, ferromagnetism, and other cooperative phenomena.
691. **DIRECTED READING IN CONTEMPORARY PHYSICS. (CREDIT TO BE ARRANGED.)** Pr., completion of 30 hours of advanced courses in physics. May be repeated for credit.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**

Political Science (PO)

Professors Fortenberry, Head, Hayhurst, Dickson, Hobbs, and Walkin

Associate Professors Johnson, Martin, Nelson, and Ward

Assistant Professors Burns, Heilman, Kelly, Latimer,

Pickering, Pendergast, Smith, Widell, and Woodard

Instructors Cannon and Coley

209. **INTRODUCTION TO AMERICAN GOVERNMENT (5).** Constitutional principles; federalism; elections and public opinion; legislative, executive, and judicial departments; principal functions.
210. **AMERICAN STATE AND LOCAL GOVERNMENT (5).** State constitutional principles; organization and functions of state government; national-state and state-local relations; special attention to Alabama government.
260. **SURVEY OF LAW ENFORCEMENT (5).** Pr., sophomore standing. (Same as LE 260.) Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation.
300. **SCOPE AND METHODS OF POLITICAL SCIENCE (5).** Pr., PO 209 or 210 and sophomore standing. Scope of and approaches to political science and its sub-specialties; survey of the basic techniques of political analysis with emphasis on data, theory, techniques and methods of empirical research.
301. **POLITICAL SCIENCE STATISTICS (5).** Pr., sophomore standing. Introduction to elementary statistical procedures applied to political science subject matter.
309. **INTRODUCTION TO INTERNATIONAL RELATIONS (5).** Pr., sophomore standing. International relations, including a consideration of the bases of national power and the rudiments of international politics.
311. **INTERNATIONAL ORGANIZATION (5).** Pr., sophomore standing. The evolution of international organization from the beginning through the United Nations.
312. **INTRODUCTION TO COMPARATIVE GOVERNMENT AND POLITICS (5).** Pr., sophomore standing. Methods of classifying governments by institutional and developmental characteristics. A review of the forces which create political stability and instability, democracy and dictatorship; contemporary political systems in selected countries will be used for comparison.
314. **AMERICAN FOREIGN POLICY (5).** Pr., sophomore standing. Analysis of the decision-making process of American foreign policy and of selected current issues of American foreign policy.
315. **AMERICAN POLITICAL THOUGHT (5).** Pr., sophomore standing. The principal American political philosophers and philosophies and their influence on political institutions.
316. **NATIONAL SECURITY AND FOREIGN POLICY (3).** Pr., sophomore standing. Introduction to national security aspects of United States foreign policy.
317. **NATIONAL SECURITY AND DOMESTIC POLICY (3).** Pr., sophomore standing. Introduction to U.S. national security in its domestic policy implications.
320. **INTERGOVERNMENTAL RELATIONS (3).** Pr., PO 209 or 210 and sophomore standing. Relationships between units of local, state and national governments in structural and policy areas; federalism in theory and practice.
323. **MUNICIPAL GOVERNMENT IN THE UNITED STATES (5).** Pr., PO 210 and sophomore standing. Functions of city government, relation of city to state; electorate, party system and popular control; forms of government; administrative organizations; some reference to Alabama.
324. **AMERICAN COUNTY GOVERNMENT (5).** Pr., PO 210 and sophomore standing. The changing role of county government in the American Federal system. Covers county government history, organization, services, finances, and political party and interest group politics.
325. **INTRODUCTION TO PUBLIC ADMINISTRATION (5).** Pr., sophomore standing. Organization, development, procedures, process, and human factors involved in administration in a political environment.
326. **THEORY OF PUBLIC ORGANIZATION (3).** Pr., sophomore standing. The structure and functioning of governmental organizations with an emphasis on theories of administrative hierarchies and evaluation of bureaucracy.
327. **POLICY AND ADMINISTRATION (5).** Pr., sophomore standing. Formulation, decision making and implementation of public policy in its administrative context.
328. **GOVERNMENT AND THE ECONOMY (3).** Pr., sophomore standing. An examination of constitutional and political bases of governmental action, the origin and evolution of policies; relationships between political and economic institutions; and the consequences of governmental action or inaction.
329. **THE AMERICAN PRESIDENCY (3).** Pr., PO 209, sophomore standing. The President as legislative leader, chief executive, chief diplomat, and commander-in-chief. Political styles and personalities of recent presidents. Presidential decision-making.
330. **INTRODUCTION TO NATIONAL LAW (3).** Pr., sophomore standing. Development of Western state legal systems, rule making, functions of law in society, legal interpretation.
331. **THE LEGISLATIVE PROCESS (3).** Pr., PO 209 or 210, sophomore standing. The principles, procedures, and problems of lawmaking in the United States; special attention to Congress and the state legislatures.

332. **THE JUDICIAL PROCESS (3).** Pr., sophomore standing. The role of the courts; the nature of jurisprudence; comparative legal systems; the origin of law, and the concept of legality.
333. **ADMINISTRATIVE RESPONSIBILITY (3).** Pr., sophomore standing. Roles and functions of public administration in a democratic society. Emphasis on bureaucratic ethics.
336. **CRIMINAL JUSTICE (3).** Pr., sophomore standing. An in-depth examination of the various procedural due process rights of the Constitution as they relate to the criminal processes—historical development, modern interpretations, and further trends.
340. **POLITICAL PARTIES AND POLITICS (5).** Pr., PO 209, sophomore standing. The nature, organization, and operation of political parties in the United States; the suffrage; nominating and electoral processes; importance and nature of interest groups.
341. **PRESSURE GROUPS (3).** Pr., sophomore standing. Major private associational groups affecting public policy in the United States. Special attention to their structures, funding, public regulation, and political activities.
342. **POLITICS AND THE MEDIA (5).** Influences of the media (broadcast and printed) on political action, the electoral process and popular concepts of political institutions; "use" of the media and its regulation by government.
355. **REPORTING OF POLITICAL AFFAIRS (3).** Pr., PO 210. (Same as JM 355.) Instruction and news assignments in political affairs with emphasis on state government. Credit in JM 355 precludes credit in PO 355.
410. **ADMINISTRATION AND MANAGEMENT OF RECORDS (3).** Pr., sophomore standing. The principles and use of records management in the systematic analysis and scientific control of the life cycle of governmental, business and university records in terms of quantity, quality, and cost.
420. **HEALTH SERVICES POLICY (5).** Political issues affecting health care services.
450. **INTERNSHIP (5-10).** Pr., PO, PUB or HA major and junior standing. (S-U grading only.) Practical political or administrative experience in public agencies or related activities arranged and approved by the department.
451. **INTERNSHIP READING COURSE (5).** Coreq., concurrent enrollment in either PO 450 or LE 464. COI. Content of reading by agreement of student and instructor. Not open to graduate students.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **AMERICAN CONSTITUTIONAL LAW I (5).** The Constitution of the United States on the basis of the decisions and opinions of the Supreme Court defining judicial review, the relationship of the executive, legislative, and judicial branches of the national government, and the federal system.
502. **AMERICAN CONSTITUTIONAL LAW II (5).** The Constitution of the United States on the basis of the leading decisions and opinions of the Supreme Court defining civil rights in relation to both national and state governments.
505. **METROPOLITAN AREA GOVERNMENTAL PROBLEMS (3).** Political, governmental, and administrative organization and actions in urban areas with many governmental entities; governmental problems resulting from urbanization and possible solutions.
514. **FINANCIAL ADMINISTRATION (3).** Theory and practice of budgeting. Emphasis on the politics of financial administration and accountability.
515. **PUBLIC PERSONNEL ADMINISTRATION (3).** Personnel policies and processes of national, state and local governments. The role of politics in public personnel management.
516. **PROBLEMS AND POLICIES IN HEALTH ADMINISTRATION (3).** Pr., PO 325. Issues in administration of health services. Implications for health administrators of current policy developments.
517. **LABOR RELATIONS IN PUBLIC ORGANIZATIONS (3).** Pr., PO 515 or equivalent. (Same as MN 517.) The background, legal and constitutional aspects and administration of group negotiations and collective bargaining in public employment. Credit for this course precludes credit for MN 517.
518. **ADMINISTRATIVE LAW (3).** General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review. Case method.
519. **PROBLEMS IN PUBLIC ADMINISTRATION (5).** Pr., COI, senior or graduate standing. Review of selected problems in public administration through readings, case studies and individual research projects.
520. **POLITICAL THOUGHT BEFORE THE NINETEENTH CENTURY (5).** The development of political thought from the Greeks to 1800; attention to the philosophers and the early theories that are found in modern political institutions.
521. **POLITICAL BEHAVIOR (5).** Pr., PO 300 or COI. An analysis of the processes of political attitude formation. Special emphasis on the development and testing of empirical theories of political culture, political socialization process, public opinion formation and participation.
522. **RECENT AND CONTEMPORARY POLITICAL THEORY (5).** The political theories of the nineteenth and twentieth centuries; analysis and comparison of modern ideologies.
523. **COMMUNIST THEORY AND PRACTICE (3).** Marxist ideology as modified by Lenin, with illustrations of actual practice drawn from all sides of the communist world.
526. **GOVERNMENTS OF WESTERN EUROPE (5).** Descriptions and analyses of the principal political structures and power systems of Western Europe with particular emphasis upon Great Britain, France, and Germany.

528. **GOVERNMENT AND POLITICS OF THE NEAR EAST (5).** The political environment, institutions, and processes of the Near East countries, radicalism and conservatism in the area, the Arab-Israeli conflict, and major power interests.
533. **GOVERNMENT AND POLITICS OF THE FAR EAST (5).** The political environment, institutions, and processes of the Far East, with emphasis on China and Japan; also foreign relations of the area including Great Power interests.
534. **GOVERNMENT AND POLITICS OF AFRICA (5).** The political environment, institutions, and processes of sub-Saharan Africa. The colonial heritage, problems of tribalism, stability, and political and economic development, with special attention to selected countries and current events and issues.
535. **CONTEMPORARY INTERNATIONAL POLITICS (5).** A survey of the conflicts of national interests in contemporary international politics with special emphasis on the efforts to resolve these issues through diplomacy. This course will give students the opportunity to apply their academic training to an analysis of actual contemporary international issues.
536. **GOVERNMENT AND POLITICS OF THE SOVIET UNION (5).** The present status of the Soviet totalitarian system with attention to its origin, the essentials of the Stalinist pattern, the post-Stalinist political dynamics, and the nature and significance of contemporary changes.
537. **SOVIET FOREIGN POLICY (5).** The factors affecting Soviet foreign policy as seen in historical perspective, with emphasis on the post-war Stalinist practices and the modifications made by the post-Stalin leadership.
538. **GOVERNMENT AND POLITICS OF EASTERN EUROPE (5).** A comparative study of the political institutions of the Eastern European Communist states, emphasizing especially those features which diverge the most from the totalitarian pattern of the Stalinist era. Attention will also be given to the foreign relations of the Eastern European powers, including those with the Soviet Union and Communist China.
539. **GOVERNMENT AND POLITICS OF LATIN AMERICA (5).** The political environment, institutions, and processes of Latin America with emphasis on dynamic factors that influence the degree of democracy and authoritarianism, stability and instability, and politico/economic development in the area.
540. **INTERNATIONAL LAW (5).** The origin and development of international law with special emphasis on recent and current developments—trends.
541. **LATIN AMERICA AND THE UNITED STATES (3).** An analysis of Latin American-United States relations in their political, social and economic aspects taking into account the natures, causes and consequences of policies followed by the nations involved.
542. **MAJOR GOVERNMENTS OF LATIN AMERICA (5).** Survey of governmental institutions and political processes in selected Latin American countries. Emphasis on Argentina, Brazil, and Mexico.
545. **GOVERNMENT AND POLITICS OF THE DEVELOPING NATIONS (5).** Broad analysis of political underdevelopment and developing nations, taking account of forces for modernization, problems of internal stability, system characteristics, ideologies, socio-economic development policies, roles in the international community and prospects.
550. **SPECIAL PROBLEMS IN HEALTH ADMINISTRATION (1-5).** Pr., COI. Qualified students conduct systematic investigation of selected problems in administration of health services under supervision of instructor.
590. **SEMINAR IN POLITICAL SCIENCE METHODOLOGIES (5).** Pr., senior or graduate standing. Critical review of the literature on approaches, analytical constructs, research techniques and data compilation in national and cross-national perspectives.

GRADUATE

611. **SEMINAR IN AMERICAN GOVERNMENT (3-5).** A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of American government.
613. **SEMINAR IN STATE AND LOCAL GOVERNMENT (3-5).** A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of state and local government. Some attention will be given to Alabama.
625. **SEMINAR IN POLITICAL PARTIES, PRESSURE GROUPS AND POLITICAL ISSUES IN THE UNITED STATES (5).** The interaction of political parties, pressure groups and the general public as a determinant in resolving political issues.
635. **SEMINAR IN PUBLIC ADMINISTRATION (5).** Various processes, functions, theories, practices and systems as treated in the literature of public administration.
636. **SEMINAR IN POLICY AND ADMINISTRATION (5).** Formation, execution, and evaluation of public policy, plus in-depth analysis of selected policy areas.
645. **SEMINAR IN COMPARATIVE GOVERNMENT (5).** The major institutions, functions, and problems of representative political systems. Includes the methodology and bibliography of comparative government and politics.
655. **SEMINAR IN INTERNATIONAL RELATIONS (5).** The basic literature of the field of International Relations with special emphasis on the critical evaluation of this material.
665. **SEMINAR IN POLITICAL THEORY (3-5).** The problems of scope and methods of inquiry in the fields of political theory with intensive research in selected topics.

675. **SEMINAR IN CONSTITUTIONAL LAW (5).** Selected areas of constitutional law with readings in depth in relevant cases and constitutional theory.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**

READING COURSES

Directed reading courses enable graduate students to pursue specialized topics. They require permission of the department head or graduate adviser, and the supervisory professor and may be repeated for credit. Normally a reading course in a subject should be taken after the seminar in that subject. Except by special permission no more than two reading courses may be taken in a master's program.

617. **READING COURSE IN AMERICAN GOVERNMENT (3-5).**
627. **READING COURSE IN PUBLIC LAW (3-5).**
637. **READING COURSE IN PUBLIC ADMINISTRATION (3-5).**
647. **READING COURSE IN COMPARATIVE GOVERNMENT (3-5).**
657. **READING COURSE IN INTERNATIONAL RELATIONS (3-5).**
667. **READING COURSE IN POLITICAL THEORY (3-5).**

Poultry Science (PH)

Professors Moore, *Head*, Edgar, and Mora
Associate Professors Brewer, McDaniel, and Roland
Assistant Professors Brake and Giambrone

201. **POULTRY SCIENCE (5). LEC. 4, LAB. 2.** Fall, Winter, Spring, Summer. Principles of poultry production, including breeding, feeding, housing, and diseases.
302. **POULTRY MEAT PRODUCTION (3). LEC. 2, LAB. 2.** Fall. Practical problems involved in raising broilers and turkeys for meat production.
- 407-409. **SUPERVISED AVIAN INVESTIGATIONS (3-3). LEC. 1, LAB. 4.** Junior standing and COI. All quarters. Investigation of some phase of avian science of interest to the student.
422. **AVIAN DISEASES (5). LEC. 4, LAB. 2.** Winter. Etiology, transmission, diagnosis, prevention and treatment of infectious and parasitic diseases. (For veterinary students only.)

ADVANCED UNDERGRADUATE AND GRADUATE

504. **POULTRY MANAGEMENT (5). LEC. 4, LAB. 2.** Pr., PH 201. Winter. Poultry problems and management of commercial flocks.
505. **POULTRY FEEDING (3).** Pr., PH 201. Fall. Composition and use of poultry feeds in connection with the demands for growth, body maintenance, and egg production.
506. **FERTILITY AND HATCHABILITY OF AVIAN SPECIES (3). LEC. 2, LAB. 2.** Pr., PH 201 or COI. Spring. Fertility, artificial insemination, embryonic development and hatchability of avian species.
508. **CONTROL OF POULTRY DISEASES AND PARASITES (5). LEC. 4, LAB. 2.** Spring. Prevention, diagnosis, control and treatment of the common diseases and parasites of poultry.
510. **GENETICS OF THE FOWL (3). LEC. 3.** Pr., ZY 300. Spring. Physiology of reproduction and inheritance of various poultry characters responsible for efficient egg and meat production and low mortality.
511. **PROCESSING AND MARKETING (3). LEC. 2, LAB. 2.** Spring. Problems involved in processing and marketing poultry meat and eggs.
523. **BIOLOGICAL RHYTHMS (5). LEC. 5.** Pr., ZY 524 or COI. Spring. Factors that affect the rhythmic pattern of organisms. Both exogenous and endogenous rhythms will be studied.

GRADUATE

604. **ADVANCED POULTRY PRODUCTION (5). LEC. 5.** Spring. Advanced studies on various phases of poultry production.
606. **ADVANCED POULTRY BREEDING (5). LEC. 4, LAB. 2.** Fall. Advanced principles of heredity as applied to poultry breeding.
607. **SPECIAL PROBLEMS. (CREDIT TO BE ARRANGED.)** COI, all quarters. (a) nutrition. (b) physiology. (c) path-parasitology. (d) microbiology. (e) immunochemistry. (f) management. (g) transmission EM (fall only). (h) scanning EM (fall only).

608. **SEMINAR. (CREDIT TO BE ARRANGED.)** Fall, Spring, Winter, Summer.
610. **ADVANCED POULTRY NUTRITION (5). LEC. 5.** Winter. Nutrients, their function and the nutritional requirements of poultry.
611. **ADVANCED POULTRY MANAGEMENT (5). LEC. 5.** Summer. Principles of management of commercial poultry flocks.
612. **ADVANCED POULTRY DISEASES (5). LEC. 1, LAB. 8.** Pr., PH 508 or COI. Fall. Isolation, cultivation, and identification of bacterial, fungal, and viral agents. Emphasis on biochemical aspects of microbial and nutritional diseases and the mechanisms of the immune response.
613. **ADVANCED POULTRY DISEASES (5). LEC. 1, LAB. 8.** Pr., VM 518 and PH 612, or equivalent. Winter. Continuation of PH 612 with emphasis on those disease conditions caused by protozoa, helminths, and arthropods and the gross and histopathology of diseases studied in both quarters.
614. **IMMUNOCHEMISTRY (5). LEC. 3, LAB. 4.** Pr., general bacteriology, immunology and organic or biochemistry. Fall. Fundamental principles of immunology including specificity, antibody synthesis and the thermodynamics of antigen-antibody reactions. Laboratory will include the use of immunodiffusion, immunoelectrophoresis, fluorescent-antibody technique and quantitation of the precipitin reaction.
615. **AVIAN PHYSIOLOGY (5). LEC. 2, LAB. 6.** Pr., ZY 524 and organic chemistry. Winter. General physiology of birds with particular reference to domesticated species.
618. **EXPERIMENTAL VIROLOGY (5). LEC. 3, LAB. 4.** Pr., BY 542 and CH 520 or equivalent and COI. Winter. Properties of plant, animal and bacterial viruses including biochemical and biophysical properties and mechanisms of infection. Laboratory includes isolation, purification and fractionation of viruses, identification of anti-viral agents using *in vitro* systems.
620. **TRANSMISSION AND SCANNING ELECTRON MICROSCOPY (5). LEC. 2, LAB. 6.** Pr., COI, graduate standing. Spring. Theory and operation of the transmission and scanning electron microscopes, techniques in fixation, embedding, sectioning, and staining. Interpretation of ultrastructures.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** All quarters. Technical laboratory. Problems related to poultry.

Psychology (PG)

Professors Lewis, Head, Gynther, Lair, and Schaeffer
Associate Professors Burkhart, DeGood, Hannay, Harzem, Irvine,
King, McCoy, Rogers, and Vallery

Assistant Professors Cunningham, Green, Hess, Kelley, Lemkau, Proctor,
and Sausser

211. **PSYCHOLOGY (5).** An introduction to the field of behavior.
212. **PSYCHOLOGY (3).** The development of human behavior.
215. **QUANTITATIVE METHODS (5). LEC. 3, LAB. 4.** Pr., PG 211 and MH 140 or equivalent. Introduction to the measurement of behavior and to quantitative methods of data analysis.
300. **INTRODUCTION TO CLINICAL AND COMMUNITY PSYCHOLOGY (3).** Pr., PG 211. Introduction to theory and methods of clinical and community psychology.
301. **PSYCHOLOGY IN THE CRIMINAL JUSTICE SYSTEM (5). LEC. 4, LAB. 2.** Pr., PG 211. Introduction to theory, research, and applications of psychological principles in the criminal justice system.
302. **PSYCHOLOGICAL ASPECTS OF DEATH AND DYING (3).** Pr., sophomore standing. A survey of psychological literature on dying, death and grief.
320. **EXPERIMENTAL PSYCHOLOGY I: LEARNING (4). LEC. 3, LAB. 3.** Pr., PG 211 and 215. Concepts, problems, and experimental techniques in learning.
321. **EXPERIMENTAL PSYCHOLOGY II: PERCEPTION (4). LEC. 3, LAB. 3.** Pr., PG 211 and 215 or departmental approval. Discrimination, generalization, and their physical and psychological correlates.
322. **EXPERIMENTAL PSYCHOLOGY III: PERSONALITY (4). LEC. 3, LAB. 3.** Pr., PG 320. Introduction to personality with emphasis placed on the nature, description, dynamics and determinants of personality.
330. **EXPERIMENTAL SOCIAL PSYCHOLOGY (4). LEC. 3, LAB. 2.** Pr., PG 211 and 212 or SY 201 and SY 204. Introduction to the field of social psychology. Laboratory work relating to investigation of social psychological problems, data collection and analysis, and report writing.
350. **BEHAVIOR MODIFICATION IN EARLY CHILDHOOD (5). LEC. 3, LAB. 4.** Pr., departmental approval. Application of learning principles to the modification of behavior in the preschool child. Laboratory practice will supplement classroom discussion.
360. **FIELDS OF PROFESSIONAL PSYCHOLOGY (5).** Contributions of psychology to medicine, education, law, and human engineering in industry. Not open to students majoring in psychology.

- 420. **PSYCHOLOGY OF WOMEN (5).** Pr., junior standing. Women from a psychological point of view covering stereotypes, roles, and origins of sex differences.
- 433. **PERSONALITY (4).** Pr., 10 hours of psychology or departmental approval. Objective, phenomenological, and psychoanalytic theories of personality.
- 435. **ABNORMAL PSYCHOLOGY (4).** Pr., 10 hours of psychology or departmental approval. Types of abnormal behavior and their social and biological origins. Opportunities for field trips.
- 444. **PSYCHOLOGICAL ASPECTS OF SEXUAL BEHAVIOR (5).** Pr., junior standing. Human sexuality from a psychobiological perspective.

ADVANCED UNDERGRADUATE AND GRADUATE

- 507. **MATURITY AND AGING (5).** Pr., PG 212. Development psychology relating to changes in and problems of human maturity from early adulthood to old age.
- 515. **INTRODUCTION TO THEORY OF MEASUREMENT (5).** Pr., PG 215 or departmental approval. Theories of measurement and psychological testing with examples of their applications.
- 516. **PSYCHOLOGICAL TESTING (5).** LEC. 3, LAB. 6. Pr., PG 515 or departmental approval. Issues and applications of group assessment techniques.
- 530. **PERCEPTION (4).** Pr., PG 321 or departmental approval. Theories of perception, emphasizing both general and individual factors that influence meaning.
- 531. **SOCIAL PSYCHOLOGY (5).** Pr., department approval. Social psychological processes and theories of social behavior.
- 534. **PSYCHOLOGY OF EXCEPTIONAL CHILDREN (5).** Pr., PG 212. Psychological aspects of handicapped and gifted children.
- 536. **PSYCHOLOGY OF ABNORMAL CHILDREN AND ADOLESCENTS (5).** Pr., PG 212. Introduction to cognitive, emotional, and behavioral disturbances in children and adolescents.
- 540. **PHYSIOLOGICAL PSYCHOLOGY (5).** Pr., PG 320 and 321 or departmental approval. The physiological correlates of behavior.
- 545. **ANIMAL BEHAVIOR (5).** Pr., PG 320 and 321 or departmental approval. Analysis of unlearned and learned animal behavior and its evolutionary development, integrating the contributions of ethological and behavioristic research.
- 550. **LEARNING (4).** Pr., PG 320 or departmental approval. Theories of learning and their logical and empirical foundations.
- 555. **HUMAN LEARNING (5).** Pr., PG 320 or departmental approval. Survey of research methodology, empirical data, and theoretical interpretations relevant to the acquisition, retention and forgetting of verbal concepts and verbal materials.
- 557. **TECHNIQUES AND APPLICATIONS OF BEHAVIOR THERAPY (5).** Pr., PG 320 or 350 and departmental approval. Analysis of empirically derived therapeutic procedures and their application to socially and clinically relevant behavior.
- 561. **INDUSTRIAL PSYCHOLOGY (5).** The uses of psychology in business and industry.
- 562. **TRAINING AND SUPERVISION OF INDUSTRIAL PERSONNEL (3).** Application of the principles of learning to the training of factory, office, and sales employees.
- 563. **INTERVIEWING AND CLASSIFYING INDUSTRIAL PERSONNEL (3).** Principles and practices in interviewing.
- 580. **HISTORY OF PSYCHOLOGY (4).** Pr., 20 hours of psychology or departmental approval. Evolution of psychology from physics, physiology, and philosophy to a science of behavior.
- 590. **SPECIAL PROBLEMS IN PSYCHOLOGY (1-8).** Pr., departmental approval. An individual problems course. Each student will work under the direction of a staff member on some experimental or theoretical problem of mutual interest. May be repeated for a maximum of 8 credit hours but only one registration per quarter permitted.

GRADUATE

- 600. **HISTORY, THEORIES, AND SYSTEMS IN PSYCHOLOGY (5).** A survey of historical developments in psychology with emphasis on the major theories and systems which have had an impact on current conceptions in psychology.
- 601. **ETHICS AND PROBLEMS OF PROFESSIONAL AND SCIENTIFIC PSYCHOLOGY (5).** Survey of ethical issues and current problems in professional and scientific psychology.
- 602. **COMMUNITY PSYCHOLOGY (5).** Historical overview of community psychology and analysis of empirical and theoretical issues in community psychology.
- 603. **SCIENTIFIC FOUNDATIONS OF PSYCHOLOGY (5).** An examination of man's attempts to understand himself and his attempts to understand the universe from the classical Greek era to the mid nineteenth-century.

605. **DEVELOPMENTAL PSYCHOLOGY I (5).** An examination and critical analysis of research on selected topics and theories in developmental psychology.
606. **ADVANCED PSYCHOLOGY OF ABNORMAL CHILDREN AND ADOLESCENTS (5).** Pr., PG 601, PG 605 and COI. An examination of the current research and theory of behavioral, cognitive, and emotional disorders in childhood and adolescence.
607. **PSYCHOLOGICAL ASSESSMENT OF CHILDREN (5).** Pr., PG 606, 670. Psychology majors only, with supervised practicum: Introduction to the cognitive and personality assessment of infants, children, and adolescents.
608. **TECHNIQUES OF PSYCHOTHERAPY AND BEHAVIOR CHANGE WITH CHILDREN (5).** Pr., PG 607 and COI. Introduction to methods of prevention and treatment of cognitive, emotional, and behavioral disorders of children and adolescents.
610. **ADVANCED INDUSTRIAL PSYCHOLOGY (5).** Pr., PG 215 and 561 or COI. Analysis of major issues in industrial-organizational psychology.
618. **TOPICS IN INDUSTRIAL-ORGANIZATIONAL PSYCHOLOGY (5).** Pr., 610 and COI. In-depth analysis of specific topics in industrial-organizational psychology. May be repeated for a maximum of 15 hours credit.
620. **EXPERIMENTAL PSYCHOLOGY I: LEARNING (5).** LEC. 4, LAB. 2, Pr., PG 320 or departmental approval. Analysis of learning, stressing experimental methodologies illustrative of major theoretical approaches.
621. **EXPERIMENTAL PSYCHOLOGY II: PSYCHOPHYSICS (5).** LEC. 3, LAB. 6, Pr., PG 321 or departmental approval. Physiology of receptor function and methodologies relating physical properties of stimulation to subject response variables.
622. **EXPERIMENTAL PSYCHOLOGY III: SOCIAL (5).** LEC. 3, LAB. 6, Pr., PG 601. Topics, literature, and methodology in social psychology.
623. **ANALYSIS OF BEHAVIOR (5).** LEC. 2, LAB. 10, Pr., PG 620. Methods and concepts of operant conditioning research with animals and humans stressing current research and literature.
625. **EXPERIMENTAL DESIGN I (5).** Pr., PG 215 or departmental approval. Probability theory, sampling distributions, estimation procedures, and hypothesis testing.
626. **EXPERIMENTAL DESIGN II (5).** Pr., PG 625. Regression and correlation, analysis of variance, and nonparametric statistics.
629. **QUANTITATIVE METHODS FOR APPLIED RESEARCH (5).** Pr., PG 625 and 626. Analysis of time-dependent data and other quantitative problems of interest to applied/professional psychologists.
631. **SOCIAL PSYCHOLOGY (5).** Pr., PG 531. Major systems and theories relating to social psychology, including Gestalt, reinforcement, psychoanalytic, role and field theory.
634. **GROUP BEHAVIOR CHANGE (5).** Pr., PG 637, 638 and departmental approval. Group psychotherapy and behavioral group techniques.
635. **THEORIES OF PERSONALITY (5).** Pr., PG 601. Analysis of current issues in personality theory.
637. **ADVANCED PSYCHOLOGY OF ABNORMAL ADULTS (5).** Pr., PG 601. Current theoretical conceptions and research in psychopathology.
638. **SYSTEMS OF PSYCHOTHERAPY (5).** Pr., PG 635 and 637, or COI. A survey of theories and research related to modern systems of psychotherapy.
639. **PRACTICUM IN BEHAVIOR CHANGE (1-5).** Pr., PG 635, 637, 638 and/or COI. Must be taken at least four consecutive quarters. A minimum of 8 hours is required for Ph.D. in clinical psychology. May be repeated for a maximum of 20 hours. Psychology majors only. Individual supervision in psychotherapy and behavior change with emphasis on developing applied clinical skills.
640. **PHYSIOLOGICAL PSYCHOLOGY (5).** LEC. 2, LAB. 10, Pr., PG 621. Physiological basis of behavior.
645. **COMPARATIVE PSYCHOLOGY (5).** LEC. 2, LAB. 10, Pr., PG 620. Analysis of intra- and inter-species behavior emphasizing physical and physiological uniquenesses, response comparability, and generalizability, of behavioral principles.
650. **THEORIES OF LEARNING (5).** Pr., PG 620. A survey of major theories of learning.
655. **HUMAN INFORMATION PROCESSING (5).** LEC. 3, LAB. 4, Pr., PG 620 or departmental approval. A survey of the manner in which humans process information, beginning with environmental effects on the sense organs and proceeding through percepts, memories, and thoughts.
656. **BEHAVIOR MODIFICATION (5).** LEC. 3, LAB. 4, Pr., PG 801. Principles of behavior modification and practical experience to supplement classroom discussion.
657. **ADVANCED BEHAVIOR THERAPY (5).** Pr., PG 656 and/or COI. The application of behavior therapy procedures within a single-case methodological framework.
669. **OBJECTIVE TECHNIQUES OF ASSESSMENT (5).** Pr., PG 515. Theory and application of methods of objective measures of aptitudes, performance, and personality.
670. **ASSESSMENT OF INTELLIGENCE (5).** LEC. 3, LAB. 10, Pr., PG 669 and departmental approval. Theories of intelligence; supervised practice in the administration and interpretation of individual intelligence tests.

671. **PERSONALITY ASSESSMENT I (5). LEC. 5. Pr.**, PG 669 and departmental approval. Theory and application of methods of personality measurement with emphasis on interview and self-report data, and on the interpretation of tests of specific behavioral deficits.
672. **PERSONALITY ASSESSMENT II (5). LEC. 3, LAB. 6. Pr.**, PG 669 and departmental approval. Psychology majors only. Theory and application of methods of personality assessment with emphasis on projective techniques and supervised practicum experience.
673. **PERSONALITY ASSESSMENT III. (CREDIT TO BE ARRANGED.)** Psychology majors only. Supervised practicum in personality assessment. Maximum of 5 hours credit may be applied to minimum requirements for master's degree.
676. **TEACHING OF PSYCHOLOGY (1-3). Pr.**, departmental approval. The problems and practices of teaching psychology at the college level. In addition to seminar meetings, students will work with senior faculty in appropriate courses. May be taken more than one quarter; credit in this course cannot count toward fulfilling the minimum 45 graduate hours for a master's degree.
680. **CURRENT RESEARCH IN PSYCHOLOGY (2). Pr., COI.** Review of current research on selected topics in psychology. Six hours credit in this course required of all doctoral students. May be repeated for a maximum of 10 hours credit.
690. **SEMINAR (CREDIT TO BE ARRANGED.)** May be taken more than one quarter but not more than one registration permitted in any one quarter.
692. **RESEARCH IN SPECIAL TOPICS. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter but not more than one registration permitted in any one quarter.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be repeated for credit.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be repeated for credit.

Rehabilitation and Special Education (RSE)

Professor W. Jarecke

Associate Professors Couch, Eaves, and J. R. Jarecke

Assistant Professors Diebold, Head, G. J. Adams, Anderson,
Graham, McDaniel, Miller, Shinnick, Stramiello, and Zongolowicz

Instructors C. A. Adams, Haynes, Tomlin

Research and Extension Associate B. L. Albritton, F. R. Albritton,
Autrey, Brolin, Brown, Clemons, Cosgrave,

Freeman, Gray

Hall, Harrington, Jones, Lesnik, Lorenz, Neeley, Pearson,

Quan, Rickicki, and Strawn

**Certain sections of common offerings are identified by use of letter designations as noted below:

(G) Gifted and Talented, (L) Learning Disabilities, (N) Speech Pathology, (O) Emotional Disturbance, (P) Mental Retardation, (Q) General Rehabilitation and Special Education, (R) Rehabilitation, and (S) Early Childhood Education for the Handicapped.

UNDERGRADUATE

- 102.** **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students outside the dual objectives program to understand teacher education and teaching as a profession.
- 104.** **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFER (1).**
330. **CAREERS IN REHABILITATION SERVICES (5).** History, legal basis, and fields of rehabilitation services. Exploration of specialty fields in medical and vocational rehabilitation such as occupational and physical therapy, speech pathology, social work, vocational evaluation, adjustment services, and rehabilitation counseling. Emphasis on those working with disabled persons and adjustment to disability.
376. **A SURVEY OF EXCEPTIONALITY (5).** An introduction to the several types of exceptionality with an emphasis upon the educational and training implications of each.
377. **INTRODUCTION TO MENTAL RETARDATION (5). Pr., RSE 376 or COI.** An introductory exploration of mental retardation as a special type of exceptionality with emphasis placed upon implications for the education and training of the retarded.
378. **AN INTRODUCTION TO BEHAVIOR DISTURBANCE (5). Pr., RSE 376 or COI.** An introductory exploration of behavior disturbance as a special type of exceptionality with emphasis placed upon implications for the education and training of the behavior disturbed.

414. **PROGRAM IN AREA OF SPECIALIZATION (3). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Program planning principles involved in designing program activities for specific area of specialization.
415. **TEACHING IN AREA OF SPECIALIZATION (3-5). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Understanding of curriculum content, methods and techniques of instruction using appropriate instructional materials, planning and evaluation of instruction for specific area of specialization.
- 420.** **ORGANIZING INSTRUCTION FOR SPECIAL EDUCATION (5). LEC. 4, LAB. 4.** Pr., RSE 376, 378, or COI. Provides the student with skills necessary to organize the special education instructional program in area of specialization.
- 425.** **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to internship, appropriate professional courses. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 446.** **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objective. Includes evaluation by professor and student of work accomplished at regular intervals.
- 450.** **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations.
- 479.** **METHODS AND MATERIALS FOR TEACHING IN SPECIAL EDUCATION (5).** Pr., RSE 376 and 378 and 420.
- 495.** **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE

510. **OCCUPATIONAL INFORMATION (3). LEC. 2, LAB. 2.** Pr., junior standing.
529. **LEARNING DISABILITIES (5).** Pr., RSE 376 or RSE 600 or COI, junior standing and COI. Theoretical issues, research, diagnosis, and educational approaches involved with children with learning disabilities. Observations of educational settings for children with learning disabilities are required.
- 530.* **EVALUATION AND TRAINING IN VOCATIONAL REHABILITATION (4). LEC. 3 HOURS DAILY FOR 6 WEEKS, INTERNSHIP 4 WEEKS.** Pr., junior standing. Purposes, principles and techniques of client evaluation and training, including personal, social and physical adjustment, vocational choice and selected techniques used in the evaluation and training process.
- 531.* **RESEARCH IN EVALUATION AND TRAINING IN VOCATIONAL REHABILITATION (4). LEC. 3 HOURS DAILY FOR 6 WEEKS, INTERNSHIP 4 WEEKS.** Pr., junior standing. A problem using research techniques, to be selected in consultation with the supervising professor.
535. **INTRODUCTION TO VOCATIONAL EVALUATION (5).** Pr., junior standing. History, philosophy, theoretical bases, and present status of vocational evaluation. Survey of the vocational evaluation process, principles, techniques, and procedure. Innovative methodology and future trends in vocational evaluation are explored.
536. **SYSTEMS OF VOCATIONAL EVALUATION (3). LEC. 1, LAB. 4.** Pr., VED 535, junior standing. Instruction and supervised practice in the application of the GATB, the JEVS system, the TOWER system, the Singer/Graflex system and related techniques of vocational evaluation.
537. **VOCATIONAL TRAINING AND OCCUPATIONAL ORIENTATION OF THE MENTALLY RETARDED. (5).** Pr., junior standing. Principles for providing occupational orientation and work experience, techniques of curriculum planning, job classification and evaluation, selection, and placement, curricular activities related to work experience, community agencies and public relations.
550. **LANGUAGE DEVELOPMENT FOR THE YOUNG HANDICAPPED CHILD (5).** Pr., junior standing and COI. A systematic, analytic approach to intervention programming for speech and language development with the young handicapped child.
- 555.** **LEARNING RESOURCES IN AREA OF SPECIALIZATION (4).** Pr., junior standing.
580. **EDUCATION OF CHILDREN WITH SPECIAL LEARNING DISABILITIES (5).** Pr., RSE 376, RSE 529, junior standing and COI. Existing theories and instructional programs for children with special learning disabilities. Administrative arrangements, classroom management, individual educational evaluation and programming are emphasized.
586. **THE SEVERELY MENTALLY RETARDED (5).** Pr., RSE 376, junior standing and COI. An in-depth study of severe mental retardation as a special type of exceptionality with emphasis upon implications for the education and training of the severely retarded.

GRADUATE

600. **ADVANCED STUDY OF EXCEPTIONALITY (5).** Pr., appropriate undergraduate preparation in Special Education or COI. An advanced study of the several types of exceptionality with an emphasis upon the educational and training implications of each.

*Offered only to participants in training programs for workshop and facility personnel in State and Regional offices of Vocational Rehabilitation.

601. **ADVANCED STUDY OF EDUCATIONAL ASPECTS OF MENTAL RETARDATION (5).** Pr., RSE 376, or RSE 600, or COI. An advanced study of mental retardation as a special area of exceptionality with emphasis upon the education and training needs of the retarded.
602. **EDUCATIONAL DIAGNOSIS AND ASSESSMENT FOR SPECIAL LEARNING PROBLEMS (5).** Pr., RSE 376 and FED 661. A comprehensive study of tests and procedures for diagnosing special learning problems. In-depth instruction in educational assessment in such areas as perceptual-motor, language, academic aptitude, and achievement.
603. **PRESCRIPTIVE TEACHING FOR SPECIAL LEARNING PROBLEMS (5).** Pr., RSE 376, RSE 602 and FED 661. In-depth instruction in specialized methods of prescriptive program planning based on educational assessments of children with learning problems. Development and presentation tasks are included.
- 625.** **INTERNSHIP (5-15).** Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
630. **DIAGNOSTIC VOCATIONAL EVALUATION (4).** Pr., PG 515 or equivalent. Process, principles, and techniques used to diagnose general assets and liabilities of the individual. Includes the functional and analysis of biographical data and the use of the evaluation interview. Emphasis is placed upon the rationale underlying the selection and use of psychometric tests in vocational evaluation.
631. **PROGNOSTIC VOCATIONAL EVALUATION (4).** Pr., RSE 630 or permission of department head. Process, principles, and techniques used to determine and predict work behavior and vocational potential. Includes the rationale underlying the selection and use of occupational exploration programs, work samples, situational tasks, simulated work experiences, and job tryouts in vocational evaluation.
632. **USE AND INTERPRETATION OF VOCATIONAL EVALUATION DATA (4).** Pr., RSE 630 and 631 or COI. Process, principles, and techniques used in the interpretation of vocational evaluation data to clients, to rehabilitation personnel, and to facility staff. Focuses upon the interpretation of data through the formal staff conference, vocational counseling, report writing, and follow-up.
634. **WORK SAMPLE DEVELOPMENT (5).** Pr., COI. Theoretical and technical principles related to the development, standardization and validation of work samples. Supervised experience in the application of work sample development principles.
643. **EDUCATION OF THE PHYSICALLY HANDICAPPED (5).** Pr., adequate courses in physiology and psychology and COI. The characteristics of major physical disabilities; the psychology of the physically handicapped; the educational objectives with curriculum adaptations, and related aspects of a total program for the physically handicapped.
- 646.** **DIRECTED INDEPENDENT STUDY (1-6).** Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student at regular intervals.
649. **TEACHING THE MENTALLY RETARDED (5).** Pr., RSE 376, RSE 378, and RSE 479P. Provides for observation and participation under supervision in educational programs for the mentally retarded. Lectures and discussions will implement the student's work in the classroom. Students will develop and evaluate plans and programs for the special class. (For teachers pursuing a program of education for mentally retarded children.)
- 650.** **SEMINAR IN AREAS OF SPECIALIZATION (3-10).** May be repeated for credit not to exceed 10 hours. Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.
- 651.** **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652.** **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653.** **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
670. **EDUCATIONAL PROCEDURES FOR CHILDREN WITH BEHAVIOR DISORDERS (5).** Pr., graduate standing and COI. Analysis of current provision for children with emotional conflicts, with emphasis on educational procedures and implications for learning disabilities.
671. **CURRENT RESEARCH ON THE BEHAVIORAL DISORDERS OF CHILDREN (5).** Pr., graduate standing and COI. Examination and interpretation of research. Emphasis on educational implications of emotional conflict, classroom guidance and control.
- 695.** **PRACTICUM (1-15).** Provides advanced students with experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Religion (RL)

Professor Armour, *Head*
Assistant Professor Kuykendall

- 201. **INTRODUCTION TO RELIGION (3).** Major themes in religion, including religious experience, religion and society, and the diversity of religion. Examples from various religious traditions.
- 210. **INTRODUCTION TO THE OLD TESTAMENT (5).** Historical-critical study of the Old Testament in its cultural setting. Emphasis upon development of Old Testament thought.
- 220. **INTRODUCTION TO THE NEW TESTAMENT (5).** Historical-critical study of the New Testament in its cultural setting. Major issues in New Testament study.
- 230. **HISTORY OF CHRISTIANITY (5).** Development of Christianity from 100 A.D. to the present. Major personalities, events, and movements.
- 245. **RELIGION AND POPULAR CULTURE (5).** Religious themes and developments in contemporary American life.
- 301. **RELIGIONS OF ASIA (5).** Hinduism, Buddhism, Taoism, Confucianism, and Islam, with secondary attention to other Asian religions.
- 325. **PAUL (5).** Pr., RL 220. Life, letters and thought of the Apostle Paul.
- 335. **HISTORY OF CHRISTIAN THOUGHT (5).** Representative trends and thinkers from 100 A.D. to 1800 A.D.
- 340. **RELIGION IN AMERICA (5).** Religious activities, institutions and personalities in North America from the Colonial Period to the present.
- 350. **CONTEMPORARY RELIGIOUS THOUGHT (5).** Pr., one course in religion. Major twentieth century theologians—Protestant, Catholic, Jewish.
- 365. **RELIGIOUS VALUES AND SEXUALITY (5).** Pr., one course in religion. Religious views of human sexuality from biblical times to the present. Emphasis upon contemporary period.
- 450. **SEMINAR (5).** Pr., senior standing. An intensive examination of a major topic in religious studies.
- 490. **READINGS IN RELIGION (3-5).** Pr., junior standing and COI. A program of independent study on a special topic. May be repeated for credit.

Secondary Education (SED)

Professors Atkins, *Head*, Easterday, and Weaver
Associate Professors Alley, Graves, Johnson, and Justice
Assistant Professors Henry, Johns, Ley, Melvin, and Rowsey
Adjunct Instructors Bentley and Danner

Courses for Undergraduate Students

- 102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students enrolled in other schools to understand teacher education and teaching as a profession as well as become acquainted with the preparation program in their areas of specialization.
- 104. **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS. (1).** Required of students completing the Teacher Education Program. Orientation to the Laboratory Experiences Program with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program and the Professional Internship.
- 110-111-112. **DEVELOPMENTAL STUDIES 1, 2, 3 (2). (CREDIT NOT COUNTED TOWARDS GRADUATION.)** Designed to develop skills conducive to successful college study. Emphasis on reading skills and their relation to other language arts. Attention is given to study skills, communication skills for formal and informal use, and cultural aspects of communication.
- 201. **EDUCATION (2).** Designed to help prospective teachers in the guidance of students. (A) Art Expression, (J) Music Experiences, (P) Communication Problems, (Q) Materials of Instruction, (R) Improvement in Reading.
- 201L. **EDUCATION (1). LAB. 2.** Laboratory will be taken concurrently with the corresponding lecture course or independent of the lecture.

Curriculum and Teaching

Undergraduate students with both a teaching major and minor in Secondary Education must take one course in Teaching (SED 405) and one course in Program (SED 410) in the major field and one course in either Teaching or Program in the minor field. Where no minor exists, the latter is not required. Undergraduate students in English Education must take SED 411, 412 and 413 instead.

Students specializing in Art, Music, Speech Communication or Dramatic Arts will be certified to teach in both elementary and secondary schools. Such students must complete both the Teaching and Program courses in the teaching field or fields in which certification is expected.

Teaching and Program courses may be scheduled and taught as separate courses, related courses, or as a unified program. Admission to Teacher Education is prerequisite for Teaching and Program courses.

For some courses, there are special sections denoted by a letter code corresponding to the areas of specialization. These areas are: (D) Foreign Language, (G) English (H) Mathematics, (K) Science, and (L) Social Science. Courses dealing with (A) Art, (C) Dramatic Arts, (J) Music, and (M) Speech Communication, are offered as inter-departmental (IED) courses.

375. **SCIENCE FICTION IN THE SECONDARY SCHOOL PROGRAM (5).** Selected works of science fiction with emphasis on the use of this genre to augment the teaching in the content areas of the secondary school curriculum.
400. **APPLIED LINGUISTICS FOR FOREIGN LANGUAGE TEACHERS (3).** The Application of linguistics in the teaching of foreign languages.
- 405.* **TEACHING IN SECONDARY SCHOOL (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI.
- 410.* **PROGRAM IN SECONDARY SCHOOL (3). LEC. 2, LAB. 2.** Pr. FED 320 or COI.
411. **TEACHING ENGLISH: LANGUAGE AND LINGUISTICS (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI. Specific teaching strategies in language and linguistics
412. **TEACHING ENGLISH: LITERATURE (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI. Specific teaching strategies in literature.
413. **TEACHING ENGLISH: RHETORIC AND COMPOSITION (3). LEC. 2, LAB. 2.** Pr., FED 320, or COI. Specific teaching strategies in rhetoric and composition.
420. **THE SECONDARY SCHOOL (5).** Current thinking about the organization and purpose of secondary schools.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education prior to internship, appropriate professional courses. Supervised teaching in a school, accompanied by scheduled discussions designed to analyze and evaluate the intern's experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** Planned individual inquiry, including evaluation by professor and student at regular intervals.
450. **SPECIAL TOPICS (1-5).** Cooperative pursuit of selected concepts and theories, normally in small groups.
495. **PRACTICUM (1-10).** Experiences designed to allow individual students to relate theory and practice.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **LANGUAGE STUDY FOR TEACHERS (5).** Linguistics in the school curriculum; the child's acquisition of syntax; theories of teaching usage, dialectology, lexicography, and grammar. English as a second language, non-verbal communication in the classroom; research studies in language and linguistics and their applications to classroom teaching.
502. **RHETORIC AND COMPOSITION FOR TEACHERS (5).** Topics and current trends in teaching rhetoric and composition. Classical and new rhetorics; theories of paragraph analysis; behavioral approaches to composition; pupil motivation and the composing process; current research; evaluation.
570. **READING IN THE CONTENT AREAS OF THE SECONDARY SCHOOL (5).** Reading problems in content areas of the secondary school and special methods of helping students overcome these problems.
575. **PROBLEMS IN IMPROVEMENT OF READING AT THE SECONDARY SCHOOL LEVEL (5).** Pr., teaching experience or COI. Problem areas of effective reading instruction in developmental reading. Grades seven through twelve. Emphasis on techniques and materials for the teaching of comprehension, study skills, vocabulary, and other related areas in the reading program and in the content areas of the secondary school.
576. **THE READING OF ADOLESCENTS (5).** Pr., SED 575 or COI. Use of adolescent and popular adult literature in the secondary school reading program. Motivation of the reluctant reader; criteria for evaluating reading materials; and self-selection/self-pacing reading programs in the English or reading classroom.
594. **ORGANIZATION OF INSTRUMENTAL MUSIC (3).** Pr., IED 414. Theory and practice in the organization and administration of instrumental music in public schools.
595. **ORGANIZATION OF CHORAL MUSIC (3).** Pr., IED 414. Theory and practice in the organization and administration of choral music in public schools.

*410L is a prerequisite for 405L.

GRADUATE

- 625. INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods and evaluation and analysis of the intern experience.
- 640-641. ADVANCED STUDY OF HIGH SCHOOL GENERAL SCIENCE (5).** Intensive study of selected topics from the area of the high school general science program.
- 646. DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
- 649. THE SECONDARY SCHOOL PROGRAM (5).** For advanced graduate students. Major curriculum areas and teaching practices in the modern secondary school. Attention given to implications of research and theory for the total secondary school program.
- 650. SEMINAR (3-10).** May be repeated not to exceed 10 hours.
- 651. RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
- 695. PRACTICUM. (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

- 599. RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
- 798. FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
- 799. RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Sociology (SY) and Anthropology (ANT)

Professor Griessman

Associate Professors Busch, Mohan, and Shields

Assistant Professors Adams, Head French, Gundlach, Kowalski, Reid,
Roberts, Starr, and Wilke

Instructors Cottier, Gilbert, Lewis, Moracco, Morgan and Wright

Lecturers Blow and Loden

Joint appointees: Associate Professor Dunkelberger

Assistant Professor Vanlandingham

Sociology (SY)

- 201. INTRODUCTION TO SOCIOLOGY (5).** Principles and processes of society.
- 202. SOCIAL PROBLEMS (5).** Pr., SY 201. A sociological analysis of current social problems such as crime, mental illness, race relations, poverty, aging, etc.
- 204. SOCIAL BEHAVIOR (5).** Pr., SY 201 or PG 211. Integrated social psychological factors which influence or determine human behavior; the emphasis is upon the normal individual and/or group situations.
- 220. STATISTICS (5).** Pr., SY 201. Basic statistical concepts, measures, and techniques used in sociological reports and research.
- 301. SOCIOLOGY OF THE FAMILY (5).** Pr., SY 201 and junior standing. The family in cross-cultural perspective.
- 302. CRIMINOLOGY (5).** Pr., SY 201, junior standing. The causes of crime and its social treatment. Field trips required.
- 304. MINORITY GROUPS (5).** Pr., junior standing. Racial composition of the United States with special emphasis on the adjustment of minority groups to the core society.

- 308. **JUVENILE DELINQUENCY (3-5).** Pr., SY 201. Historical and contemporary considerations relative to the juvenile offender. The emphasis is upon research data from the various sciences attempting to deal with this problem.
- 309. **SOCIAL THOUGHT (5).** Pr., SY 201 or COI. Significant social thought leading to the emergence of modern sociological theory.
- 310. **SOCIAL ORGANIZATION (5). ALTERNATE YEARS.** Pr., SY 201 or COI. Focuses on the systems of roles, norms, and shared meanings that provide regularity in social interaction.
- 311. **TECHNOLOGY AND SOCIAL CHANGE (3). GENERAL ELECTIVE.** Pr., junior standing. Relationship between technological development and changes in modern society. Special emphasis placed upon the human relations aspects of modern science. Designed primarily to meet social science needs of students in the fields of engineering, agriculture, education, and the physical sciences.
- 317. **SOCIOLOGY OF MENTAL ILLNESS (5).** Pr., SY 201. Examines major sociological theories and research concerning emergence, definition and treatment of mental disorders in different cultural contexts; emphasizes role of social institutions involved.
- 350. **SOCIOLOGY COLLOQUIUM (1).** Pr., SY 201. Designed to orient sociology majors toward major substantive fields of the discipline. May be repeated for maximum of 3 credit hours.
- 370. **METHODS OF SOCIAL RESEARCH (5).** Pr., SY 201 or RSY 361. The principal methods of data collection and analysis in sociological research. Same as RSY 370. Credit in RSY 370 precludes credit in SY 370.
- 410. **SOCIOLOGY OF KNOWLEDGE (5).** Pr., SY 201 or COI. A review of sociological approaches to the understanding of human knowledge; a tracing of connection between knowledge and other facets of the sociocultural context.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. **POPULATION PROBLEMS (5).** Problems of quantity and quality of population including problems of composition, distribution, and migration. Attention is given to Alabama population.
- 502. **SOCIAL THEORY (5).** Pr., SY 201 or COI. Survey of theorists from Comte to the present; emphasizes theory construction, theoretical analysis, and differences in theoretical approaches.
- 504. **SOCIOLOGY OF POWER (5).** Pr., SY 201. A systematic concern with the dimensions and distribution of power in social life.
- 505. **URBAN SOCIOLOGY (5).** Growth and decline of cities with special emphasis on ecological and demographic characteristics, associations and institutions, class systems, and housing and city planning.
- 507. **PUBLIC OPINION AND PROPAGANDA (5).** Pr., SY 201. The area of social communication; the formation, place and importance of publics in modern society. of public opinion research, and of propaganda and public relations techniques.
- 508. **INDUSTRIAL SOCIOLOGY (5).** Pr., SY 201. The sociological approach to business organization and industrial relations. Emphasis given to organization principles operative in the economic life within a social system such as a factory or business establishment.
- 509. **SOCIOLOGY OF RELIGION (5).** Pr., SY 201 or COI. Analysis of religion as a social institution as found in the world's great religions.
- 514. **FIELD INSTRUCTION (1-10).** Pr., COI. Supplementary instruction concurrent with experience in some field of work involving application of sociological perspectives to community life. May be repeated for a maximum of 10 hours credit.
- 515. **SOCIAL STRATIFICATION (5).** Pr., SY 201. Stratification is a fundamental feature of all societies. Past thought and current research and theory on structured social inequalities is systematically developed.
- 518. **SOCIOLOGY OF OCCUPATIONS (5).** Pr., SY 201. A comprehensive examination of specific occupational categories ranging from professional to service occupations. Special emphasis is placed on the relationship of occupational structure and institutions and the meaning of occupations for individuals and society.
- 520. **RACIAL AND ETHNIC RELATIONS (5).** Pr., 10 hours of SY or COI. Utilizes cross-cultural data to describe situations in which race or ethnicity affect human behavior. These data interpreted by delineating patterns, trends, and relationships.
- 522. **SPECIAL TOPICS IN SOCIOLOGY (1-5).** Pr., SY 201 or COI. Examines selected topics from a sociological perspective. May be repeated for a maximum of 10 hours.
- 525. **SOCIAL DEVIANCE (5).** Analysis of factors in the creation of and reaction to social deviance. Examines various theoretical approaches to deviance, with particular emphasis on how behavior comes to be defined as deviant.
- 526. **PENOLOGY (5).** Pr., SY 302. The history and development of corrections with particular emphasis upon modern rehabilitative processes.
- 528. **SMALL GROUPS (5).** Pr., SY 204, PG 330, or COI. Small group research and theory covering such areas as interpersonal exchange, group formation, social influence, and problem-solving behavior.
- 530. **CONTEMPORARY CORRECTIONS (5).** Pr., SY 302 or 526 or COI. Examination of current adult correctional programs and practices. Emphasis on community corrections.

534. **SOCIALIZATION (5).** Pr., SY 201. Examines an important and distinct sociological tradition: mind, self, society and interaction as symbolic phenomena grounded in social processes. Covers major intellectual influences, concepts, and figures (e.g., James, Mead, Cooley).
550. **DIRECTED READING (1-5).** Pr., COI. Senior standing. An independent reading program, under supervision, to provide for the pursuit of specific interests in sociology not covered by other course offerings. May be repeated for a maximum of 10 hours credit.
577. **SEMINAR IN MEDICAL SOCIOLOGY (5).** Pr., SY 201 or COI. The nature and organization of medical practice and health delivery systems. Special attention to role of physicians and various views of patients and disease. Relationship between culture, politics, and health.

GRADUATE

602. **SEMINAR IN THE FAMILY (5).** Pr., SY 301 or COI. Study of the institutions of marriage, family, and kinship from a comparative and historical perspective.
603. **SOCIAL PROBLEMS (5).** Pr., SY 202 and COI. Special social problems such as old age, crime and delinquency, minorities, etc., within the framework of social problem theory.
604. **SEMINAR IN RACE AND CULTURE (5).** Pr., SY 201 and 304 or COI. Adjustment of races to culture with particular reference to the South; the historical and cultural background of the races in America; bi-racial system; problems of race relations.
608. **ORGANIZATIONAL ANALYSIS (5).** A theoretical and empirical examination of the principal features of large-scale organizations in contemporary society. Directed research into particular organizational areas of present-day social life.
610. **SEMINAR IN SOCIAL BEHAVIOR (5).** Pr., SY 204, PG 330, or COI. Research and theory concerning social and group influences on behavior.
619. **THEORY CONSTRUCTION (5).** Pr., SY 201; SY 309 or 502, or COI. Orientation and insight into the logic of theory construction in the social sciences, and the complementary problems of articulating research findings with theory.
620. **ADVANCED SOCIOLOGICAL THEORY (5).** Pr., COI. This course reviews principal types of sociological theory, exchange theory, and structural functionalism. It focuses on significant theoretical issues.
630. **STATISTICAL APPLICATIONS IN SOCIOLOGICAL RESEARCH (3-5).** Pr., SY 220 or COI. A general survey of uses and limitations of statistical techniques used in sociology.
650. **SOCIOLOGY SEMINAR (5).** Pr., COI. Designed for students engaged in intensive study and analysis of sociological subject areas. May be repeated for a maximum of 10 credit hours.
680. **INDEPENDENT STUDY (1-5).** Under supervision, to read and study materials in some substantive area of sociology.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)** May be repeated for credit.

Rural Sociology

(For course descriptions, see Department of Agricultural Economics and Rural Sociology.)

Anthropology (ANT)

203. **INTRODUCTION TO ANTHROPOLOGY (5).** Pr., sophomore standing. The anthropological perspective from the four major fields of anthropology: physical, cultural, archaeological, and linguistic.
206. **CULTURAL ANTHROPOLOGY (5).** Pr., ANT 203. The nature of culture. Comparative approach to the study of the principal institutions of human society and basic categories of human behavior.
207. **INTRODUCTORY ARCHAEOLOGY (5).** Pr., SY 201 or ANT 203. The history, principles, and methods for investigating and reconstructing past cultures.
303. **HISTORY OF ANTHROPOLOGICAL THEORY (5).** Pr., ANT 203. The development of ethnological theory.
305. **CULTURE AND PERSONALITY (3).** Pr., SY 201 or ANT 203. Socio-cultural factors in personality development and recent studies in national character.
306. **INTRODUCTION TO PHYSICAL ANTHROPOLOGY (5). LEC. 3, LAB. 3.** Pr., ANT 203. Human origins and development; contemporary primate varieties, using a genetic and anthropometric approach.
314. **ANTHROPOLOGY OF WORK (3).** Pr., junior standing. Anthropological theory and data applied to problems of various work settings.
403. **CONTEMPORARY ANTHROPOLOGY (5).** Pr., ANT 203, junior standing. Contemporary research and theory regarding primitive, traditional, and urban cultures.

ADVANCED UNDERGRADUATE AND GRADUATE

511. **LANGUAGE AND CULTURE (5).** The social basis of verbal communication; functions of language in society; importance of language in contemporary social problems.
512. **GENERAL ETHNOLOGY (5).** Surveys ethnological data from several societies in order to provide an understanding of the range and variability of cultural phenomena.
524. **SPECIAL TOPICS IN ANTHROPOLOGY (1-5).** Pr., ANT 203 or COI. Examines selected topics from an anthropological perspective. May be repeated for a maximum of 10 hours.
532. **INDIANS OF NORTH AMERICA (5).** Aboriginal cultures of North America. Effects of culture contact. Contemporary problems of Indian communities.
612. **SPECIAL TOPICS IN ETHNOLOGY (5).** Pr., COI. An intensive study of peoples and cultures from a particular geographical area of cultural adaptation.

Social Work (SW)

252. **SOCIAL WORK COLLOQUIUM (2).** Orientation to the social work field and the human service professions. Explores the nature of undergraduate social work education and careers resulting from this type of instruction.
375. **INTRODUCTION TO SOCIAL WELFARE (5).** Pr., sophomore standing. The development of U.S. social welfare programs, policies, and services. Emphasizes political, economic, and social factors involved. Introduction to health and welfare services of local community.
376. **COMMUNITY SOCIAL SERVICES (3).** A review of the social services available in a typical community including: public assistance; medical service for the indigent; protective services; adoption; mental health; child care; family planning; employment training, etc. Emphasis upon the substance of services and the organizational character and administrative problems of social services.
380. **FOUNDATIONS OF SOCIAL WORK (5).** Pr., SY 201. The integration of social science perspectives for the social work student. Surveys interpretations of biological, socio-psychological, and cultural determinants of behavior for social work practice.
420. **SOCIAL WORK FIELD PLACEMENT (1-15).** Pr., SW 375, 380, and COI. A planned field experience in which the student is placed in a community service agency, working under the joint supervision of the agency and the University. A seminar is held regularly to evaluate, discuss, and interpret the student's work.
426. **SPECIAL TOPICS IN SOCIAL WORK (1-5).** Pr., SY 201 or COI, junior standing. Examines selected topics from a social work perspective. May be repeated for a maximum of 10 hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

506. **SOCIAL WORK METHODS I (5).** Pr., SW 375, SW 380 or COI. Basic methods in social work practice include interviewing skills, assessment of client concerns, and contracting. Attention given to social work process with individuals, groups, and communities. Explores treatment techniques, concepts, and principles. Use of role playing and video taping.
507. **SOCIAL WORK METHODS II (3).** Pr., SW 506. Continuation of SW 506, stressing a review of research on social casework effectiveness and study of community organization and administrative techniques.
508. **SOCIAL WORK METHODS III: MACRO-LEVEL PRACTICE (3).** Pr., SW 507. Emphasis upon social work practice related to community organization and social planning.
575. **SOCIAL WELFARE POLICY (5).** Pr., SW 375 or COI. Current problems, policy issues, and proposals in selected social welfare programs are critically examined and evaluated.

Speech Communication (SC)

Professors Bradley, Head, Barker, Harrison, Lashbrook, and Richardson

Associate Professors Moore, Overstreet, Phillips, and Smith

Assistant Professors Borton, Clavier, Freeman, Garrison, Haynes, Rushin, Sanders, Solomon, and Thomas

Instructors Watson and Woodward

a. Communication Theory/Rhetoric and Public Address

200. **INTRODUCTION TO UNDERGRADUATE STUDY IN SPEECH COMMUNICATION (5).** Acquaints the prospective speech major or minor with the fundamentals of speech, the historical, psychological, sociological, and other bases of speech.
202. **APPLIED SPEECH COMMUNICATION (3).** LEC. 2, LAB. 3. To improve the efficiency and effectiveness of oral communication by covering the human organism as an oral communicator, the process of transmission and reception of information, the process of behavioral change and the ethical responsibilities involved.

- 203. VOICE AND ARTICULATION (3).** Provides a body of knowledge about voice production and articulation (articulation, pronunciation, and intonation) for persons interested in knowing what the productive act of speaking is about and applying this knowledge to the improvement of their own speech.
- 204. INTRODUCTION TO PUBLIC RELATIONS (5).** The broad spectrum of the field of public relations. The various communication skills and technologies necessary for successful public relations will be identified and explored. Credit for this course precludes credit for JM 204.
- 211. PUBLIC SPEAKING (5).** Content, organization, style, delivery, adaptation to the audience, ethics, and criticism. Theory and practice, composition and delivery of original speeches.
- 273. GROUP PROBLEM SOLVING THROUGH DISCUSSION (5).** Group problem solving through discussion. The values and limitations of discussion, the prerequisites of reaching agreement, and a systematic approach to solving problems in group discussion. Leadership in problem solving.
- 275. DEBATE WORKSHOP (1).** Introduction to the national debate question for beginning debaters interested in competition debate. Lecture and practical work. May be repeated for a maximum of 3 credit hours.
- 301. SPEECH COMMUNICATION THEORIES (5).** The nature, purposes, and process of oral communication. Theories of language, goals of various forms of oral communication are considered. Deviations from normal speech and special problems in communication are explored.
- 326. INTERPERSONAL COMMUNICATION (5).** An analysis and comparison of several approaches to the study of current problems in interpersonal behavior and relational communication. Topics will include: contexts of varying person perception; interpersonal attraction; and how person perception is related to behavior.
- 371. PARLIAMENTARY PROCEDURE (1).** To aid the individual who may lead or participate in discussions or organizations where orderly procedure is needed. Theory and practice both employed.
- 375. DEBATE WORKSHOP (1).** Advanced national debate question for experienced debaters. Analysis of logical, emotional proofs in competition debate. Lecture and practical work. May be repeated for a maximum of 3 credit hours.
- 378. ARGUMENTATION AND DEBATE (5).** Debating techniques and procedures; their application to issues of current public interest; the gathering, organization, and presentation of facts, proofs, evidence.

Note: All 500 level courses in the various areas of Speech Communication are Advanced Undergraduate and Graduate.

- 501. PSYCHOLOGY OF COMMUNICATION (5).** Pr., one course in psychology. Speech as a psychological phenomenon with consideration of language development, symbolism, verbal learning. Small groups and audience behavior and psychological studies in various areas of communication situations.
- 502. EXPERIMENTAL METHODS IN COMMUNICATION (5).** A survey and analysis of experimental and empirical research in communication with emphasis on experimental designs.
- 503. NONVERBAL COMMUNICATION (5).** Research and theory in several areas of non-verbal communication including kinesics, proxemics, paralinguistics, environment, and personal appearance.
- 504. PUBLIC RELATIONS CASE STUDIES AND PROBLEM SOLVING (5).** Pr., SC 204, or JM 204, or COI. Investigation and analysis of public relations problems through case studies, and an application of necessary skills and techniques in solving public relations problems. Credit for this course precludes credit for JM 504.
- 505. SURVEY RESEARCH METHODS IN MASS COMMUNICATION (5).** Theory and practical experience in methods of survey research in mass media and public relations. Sampling techniques, interview strategies, questionnaire development, and data analysis.
- 508. SPECIAL TOPICS IN SPEECH COMMUNICATION (1-5).** Examines selected topics in Speech Communication. May be repeated; only 5 hours applicable to the major.
- 509. SOCIAL DIALECTS (5).** Investigates origin and nature of different dialects of American English. Focuses on the characteristics and causes of social dialects and the problems encountered in our society because of their existence. Particular emphasis will be placed on social dialects in Alabama.
- 510. COMMUNICATION STRATEGIES OF SOCIAL MOVEMENTS (5).** An examination of the communication techniques of contemporary social movements to attract members, solidify support and effect social change. Topics to be covered include: stages of development of movements; issues, persuasive strategies and stylistic devices of representative groups; and, nature and impact of social movements.
- 511. PERSUASIVE SPEAKING (5).** Pr., SC 211 or COI. Understanding, practicing, and analyzing persuasion. Survey of alternative theoretical approaches to attitude formation and change. Practical experience in organizing and presenting persuasive messages. Developing skills as a critical evaluator of persuasion in natural settings.
- 512. COMPUTER APPLICATIONS TO COMMUNICATION THEORY AND RESEARCH (5).** Applies computer simulation techniques to the process of message construction, diffusion of information, small group interaction and organizational network analyses. Course also utilizes statistical packages in the testing of the communication dependent hypotheses.
- 578. DIRECTING FORENSICS (5).** An examination of the various philosophies of forensic programs. Representative forensic situations; leading theorists.

GRADUATE

601. **INTRODUCTION TO GRADUATE STUDY IN SPEECH COMMUNICATION (5).** Exploration of areas in which research is needed; resources available; methods of research in speech; structuring the research problem; presenting the results of research in speech.
602. **MEASUREMENT IN COMMUNICATION RESEARCH (5).** Response measurement techniques and their application to behavioral research in communication. Particular attention to attitudinal and electrophysiological phenomena.
- 603-604. **DEVELOPMENT OF RHETORICAL THEORY I, II (5-5).** Pr., COI. Advanced studies in the historical development of writings, men, and movements. Materials selected from the periods: A. Ancient and Medieval. B. Renaissance and Modern.
606. **SEMINAR: STUDIES IN COMMUNICATION THEORY (5).** Contemporary theories and analysis of concepts, models and pertinent research in interpersonal communication. Consideration of selected topics.
607. **INDEPENDENT STUDY (1-5).** Prior written approval required. Conferences, readings, research, and reports in one of the listed categories. May be repeated for a maximum of 5 hours credit.
608. **SEMINAR IN PERSUASION AND ATTITUDE CHANGE (5).** A critical examination of current theory and research in the area of the persuasive act and its effects. Particular attention to current departmental projects as examples of present research.
611. **BRITISH PUBLIC ADDRESS (5).** Pr., COI. An analysis of the speakers and issues representative of the period 1600-1840 in Great Britain, including the foundations of British public address.
613. **AMERICAN PUBLIC ADDRESS I (5).** Criticism of selected speakers, and speeches, 1750-1860, studied against a background of political, social, and intellectual issues.
614. **AMERICAN PUBLIC ADDRESS II (5).** Criticism of selected speeches and speakers, 1860 to present, studied against a background of political, social, and intellectual issues.
615. **RHETORICAL CRITICISM (5).** Pr., COI. The history and method of rhetorical criticism. Application of critical standards to selected men and their work.
672. **SEMINAR IN SMALL GROUP COMMUNICATION (5).** Principles of human communication as they apply to the small group setting. Processes associated with group decision-making.
673. **SEMINAR IN GROUP AND ORGANIZATIONAL COMMUNICATION (5).** Group decision-making within an organizational setting. How groups effect change within functioning organizations. Processes associated with the diffusion of innovations.
678. **SEMINAR IN ARGUMENTATION AND DEBATE (5).** Systems of argumentation as inquiry and advocacy; studies of debate as a decision making procedure; representative argumentation theorists and leading practitioners.
699. **THESIS. (CREDIT TO BE ARRANGED.)**

b. Interpretation

320. **FUNDAMENTALS OF ORAL INTERPRETATION OF LITERATURE (5).** Oral readings of prose, poetry and drama, enhancing the student's understanding and appreciation of the art of literature by engaging him actively in reading the literary text aloud.
521. **ORAL INTERPRETATION OF PROSE (5).** Pr., SC 320 or COI. Develops skill in the oral reading of creative prose; Theories concerning the sound, sense, and performance of prose.
522. **ORAL INTERPRETATION OF POETRY (5).** Pr., SC 320 or COI. Theories concerning problems in reading verse, criticism and performance; modes of group performance are included.
523. **READERS THEATER (5).** Pr., SC 320 or COI. Investigates literature appropriate to group performance and treats the techniques of adaptation, compilation, rehearsal and staging of non-dramatic literature.

GRADUATE

620. **DEVELOPMENT AND THEORY OF INTERPRETATION (5).** The growth and change of theories regarding oral interpretation.

c. Mass Communication

230. **INTRODUCTION TO BROADCASTING (5).** The history, growth, and development of broadcast communications and the legal, social, and political aspects of broadcasting.
235. **MODES OF FILM COMMUNICATION (5).** The film industry's contribution to television and other forms of mass communication; an analysis of the styles and forms of film production as entertainment, communication, education and art.

334. **BROADCAST PRODUCTION TECHNIQUES—RADIO (5).** Pr., COI. Analysis of the creative efforts and responsibilities in the primary stages of broadcast production. Practice in writing, producing, directing, performing, and crewing radio productions and taped material.
335. **CINEMA AND SOCIETY (5).** Pr., SC 235 or COI. The role of film, its history, contributions and effectiveness as an area of expression and communication; an analysis of the social, artistic, economic and cultural factors which have influenced the film.
336. **TELEVISION PRODUCTION—DIRECTION I (5).** Pr., COI. Individual and group projects in the development and production of programs and formats; and intense study of directing theory and the director's role through presentation of educational and dramatic materials.
337. **FILM PRODUCTION I (5).** Pr., SC 235 or COI. Theory and principles of film making. Special instruction given through practical application of silent film to the problems of production planning, writing, direction, cinematography, and editing.
338. **BROADCAST NEWS WRITING (5).** Pr., COI. Writing and editing news and informational materials for television and radio. Students solicit and prepare news from and for local sources.
- 431-432. **MASS COMMUNICATION WORKSHOP (3-3).** Pr., SC 330, 235, 336, and departmental approval. Experience as a part-time staff member with an approved local station or production company.
531. **THE SOCIAL INFLUENCE OF MASS COMMUNICATION (5).** Functions and effects of mass communication on contemporary social norms and values. The impact of the media on the level of violence and aggressive behavior; the nature of the political process; and individual attitudes and behavior.
534. **RADIO PRODUCTION TECHNIQUES II (5).** Pr., SC 234 or COI. A continuation of SC 234 with further refining of writing, producing, directing, performing and crewing radio productions and audio taped material.
536. **TELEVISION PRODUCTION—DIRECTION II (5).** Pr., SC 336. Individual and group projects in the creation of program material with special emphasis on the writer-producer and his role in the industry.
537. **TELEVISION PRODUCTION III (5).** Pr., SC 336 and 536 or COI. Individual and group projects in the writing and producing of television programs with an emphasis on preparation of graphics, lighting and on-camera talent.
538. **TELEVISION—RADIO—FILM WRITING (5).** Pr., COI. The technique of writing dramatic and non-dramatic material for television, radio, and films. Special emphasis is placed on performance. Students may elect to emphasize one area.

GRADUATE

630. **STUDIES IN MASS COMMUNICATION (5).** Pr., COI. Combined media and their relationship with speech and communication.
631. **DEVELOPMENT OF AMERICAN BROADCASTING (5).** Pr., COI. The origin of radio and television broadcasting and its development to the present day.
632. **BROADCAST PROGRAMMING AND CRITICISM (5).** Pr., COI. The theory and practice of programming, its problems and concepts, coupled with an analysis of the criticism leveled at the process and the product.
633. **BROADCAST REGULATIONS (5).** The social and political control of broadcasting by agencies, groups, and organizations through legal, social, and economic means.

d. Speech Pathology and Audiology

(Speech Pathology)

340. **THE SPEECH AND HEARING MECHANISM (5).** Anatomy and physiology of the speech and hearing mechanism.
341. **PHONETICS (3).** LEC. 2, LAB. 3. Principles of phonetics and their application to speech.
350. **INTRODUCTION TO SPEECH PATHOLOGY—AUDIOLOGY (5).** Survey of the field of speech pathology-audiology. Includes history of the profession, the inter-relatedness of the various pathologies, general principles of evaluation and therapy, and the profession itself.
455. **INTRODUCTION TO CLINICAL PROCEDURES IN SPEECH PATHOLOGY (1).** Pr., SC 551 or 552 or equivalent. Orientation to clinical activities in the area of Speech Pathology. Clinical observation required.
456. **CLINICAL INSTRUMENTATION AND TEST PROCEDURES (1).** Pr., SC 455 or equivalent. Orientation to diagnostic and therapy instrumentation and procedures. Clinical observation required.
457. **THERAPEUTIC PROCEDURES IN SPEECH PATHOLOGY (2).** Pr., SC 456, 553, or 554 or equivalent. Introduction to therapeutic methods and program writing. Clinical practice in speech therapy procedures required.
458. **ADVANCED THERAPEUTIC PROCEDURES IN SPEECH PATHOLOGY (2).** Pr., SC 457, 553, and SC 554 or equivalent. Orientation and an introduction to supervised clinical activity in the area of speech disorders. Clinical practice required. May be repeated for credit.
459. **CLINICAL SPEECH PRACTICUM IN THE PUBLIC SCHOOLS FOR EDUCATION MAJORS (1).** Pr., SC 458. Orientation and an introduction to supervised clinical activity in the area of public school speech and language disorders. Clinical practice required. May be repeated twice for credit.

- 550. **PRINCIPLES OF SPEECH CORRECTION (5).** Not open to students emphasizing or majoring in speech correction and audiology. Basic principles underlying a speech correction program in a school setting. Description and discussion of speech disorders; surveys and identification techniques.
- 551. **ARTICULATION DISORDERS (5).** Pr., SC 340, 341, or equivalent. Introduction to the principles of normal and deviant articulation acquisition.
- 552. **LANGUAGE DISORDERS (5).** Pr., SC 340, 341, or equivalent. Introduction to the principles of normal and deviant language acquisition.
- 553. **FLUENCY DISORDERS (5).** Pr., SC 340, 341, or equivalent. Introduction to the principles of fluent and dysfluent verbal behavior.
- 554. **VOCAL DISORDERS (5).** Pr., SC 340, 341. Introduction to the principles of normal and deviant vocal behavior.
- 555. **NORMAL ASPECTS OF HUMAN VERBAL COMMUNICATION (5).** Pr., SC 340, 341. Introduction to the normal processes of speech, language and hearing including: the physiological aspects of normal human speech communication, the hemispheric processing of language, the acoustical aspects of speech production and transmission, the psychoacoustic aspects of speech reception and the perceptual variables associated with linguistic behavior.

GRADUATE

- 650. **CLINICAL PROBLEMS IN SPEECH (1-3).** Pr., SC 455-458 series or COI. Methods, techniques, and clinical management of the disorders of speech. Clinical practice required. May be repeated for credit.
- 651. **ARTICULATION DISORDERS (4).** Pr., SC 551 or COI. Empirical and theoretical bases for articulatory pathologies, diagnoses, and therapies.
- 652. **LANGUAGE DISORDERS (4).** Pr., SC 552 or COI. Empirical and theoretical bases for language pathologies, diagnoses, and therapies.
- 653. **FLUENCY DISORDERS (4).** Pr., SC 553 or COI. Empirical and theoretical bases for dysfluency disorders, diagnoses, and therapies.
- 654. **VOICE DISORDERS (4).** Pr., SC 554 or COI. Empirical and theoretical bases for voice pathologies, diagnoses, and therapies.
- 655. **DISORDERS ASSOCIATED WITH CNS PATHOLOGIES. (4).** Pr., SC 552 or COI. Empirical and theoretical bases for speech/language disorders associated with CNS pathologies, diagnoses, and therapies.
- 656. **CLEFT PALATE (4).** Pr., SC 551 or COI. Empirical and theoretical bases for speech/language pathologies associated with cleft palate, diagnoses, and therapies.
- 657. **SEMINAR IN SPEECH PATHOLOGY. (CREDIT TO BE ARRANGED.)** Pr., SC 551, 552, 553, 554, or COI. Advanced treatment of contemporary topics and trends, as well as current research aspects of speech pathology. May be repeated for credit with change in topics.
- 658. **FIELD EXPERIENCE IN SPEECH PATHOLOGY (5-10).** Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults. May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.

(Audiology)

- 465. **INTRODUCTION TO CLINICAL PROCEDURES IN AUDIOLOGY (1).** Pr., SC 560 or equivalent. Audiological instrumentation and test procedures. Clinical observation in audiological procedures required.
- 466. **AUDIOLOGICAL EVALUATION PROCEDURES (2).** Pr., 465 and 561 or equivalent. Procedures in audiometric evaluations. Clinical practice in audiological procedures required.
- 467. **ADVANCED AUDIOLOGICAL EVALUATION PROCEDURES (2).** Pr., SC 466 and 562 or equivalent. Procedures in hearing evaluations, hearing aid evaluations, and aural rehabilitation. May be repeated for credit.
- 560. **INTRODUCTION TO AUDIOLOGY (5).** Principles of auditory reception, the hearing mechanism and the problems involved in measuring, evaluating, and conserving hearing. Clinical observation.
- 561. **HEARING PATHOLOGY (5).** Pr., SC 560 or equivalent. Evaluation and rehabilitation of aural handicapped children and adults; hearing aids and hearing training. Clinical practice.
- 562. **HEARING EVALUATION, REHABILITATION AND CONSERVATION (5).** Pr., SC 561 or COI. Detailed concern for the rehabilitation problems of children and adults in the area of auditory training, speech reading and speech conservation. Clinical practice.

GRADUATE

- 660. **CLINICAL PROBLEMS IN HEARING (1-4).** Pr., SC 560, 561, 562, or COI. Methods, techniques, and clinical management of the disorders of hearing. Clinical practice required. May be repeated for credit.
- 661. **PEDIATRIC AUDIOLOGY (4).** Pr., SC 560, 561, 562, or COI. Etiologic factors, screening, audiologic assessment, differential diagnosis, and clinical management of infants and children with hearing disorders.

662. **ADVANCED CLINICAL AUDIOLOGY I (4).** Pr., SC 560, 561, 562, or COI. Audiometric calibration, instrumentation, and physical requirements for audiometry. Introduction to advanced audiometric techniques, with an emphasis on evaluation of the peripheral auditory system.
663. **ADVANCED CLINICAL AUDIOLOGY II (4).** Pr., SC 560, 561, 562, or COI. Continuation of SC 662. Advanced techniques in differential diagnosis of auditory function emphasizing assessment of pseudohypoacusis, the central auditory system and the use of physiologic methods.
664. **AURAL REHABILITATION (4).** Pr., SC 560, 561, 562, or COI. Clinical and therapeutic management of persons with hearing disorders, including selection and use of individual and group amplifying systems and electro-acoustic measurement of hearing aid performance.
665. **INDUSTRIAL AUDIOLOGY (4).** Pr., SC 560 or COI. Measurement and control of environmental noise, industrial audiometry, medico-legal aspects, and conservation of hearing.
666. **PHYSIOLOGICAL ACOUSTICS (4).** Pr., SC 560, 561, 562, or COI. Review of the layout of the auditory pathways, instrumentation, psychoacoustics and electrophysiology of the auditory system, as well as literature related to normal audition.
667. **SEMINAR IN AUDIOLOGY. (CREDIT TO BE ARRANGED.)** Pr., SC 560, 561, 562, or COI. Advanced treatment of contemporary topics and trends, as well as current research aspects of audiology. May be repeated for credit with change in topics.
668. **FIELD EXPERIENCE IN AUDIOLOGY (5-10).** Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults. May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.

Technical Services (TS)

Associate Professors Blakney, McClung, and Goolsby
 Assistant Professors Clement, *Acting Head*, Conner, McMurtry, and Wingard
 Instructors Goff, Leach, and Conrad

100. **INTRODUCTION TO MANUFACTURING PROCESSES (2).** LEC. 1, LAB. 2. Laboratory oriented studies in economic production principles related to metal and plastic product manufacturing.
102. **GRAPHICAL COMMUNICATION & DESIGN (2).** LAB. 6. Graphical technique and projective geometry relating to spatial visualization and communication in design.
104. **DESCRIPTIVE GEOMETRY (2).** LAB. 6. Pr., TS 102. Basic principles pertaining to point, line and plane, including development problems.
105. **ENGINEERING DRAWING II (2).** LAB. 6. Pr., TS 102. Advanced phases of graphical techniques and conventions including technical sketching.
107. **GRAPHICAL ANALYSIS AND DESIGN (2).** LAB. 6. Pr., TS 102. Application of orthographic projection principles in solving engineering problems.
108. **DESIGN FOR MANAGEMENT (2).** LAB. 6. Pr., TS 102, 107 or equivalent. Fundamental graphical concepts relative to management activities including design and communication.
111. **WOODWORKING (1).** LAB. 3. Introduction to machines, tools, and materials used in working with wood.
112. **WELDING SCIENCE AND APPLICATION (1).** LAB. 3. Basic principles and application of welding and cutting processes in the fabrication of metals.
113. **MACHINE TOOL LABORATORY (1).** LAB. 3. Introduction to metal removal processes; basic machines of production.
114. **SHEET METAL DESIGN AND FABRICATIONS (1).** LAB. 3. Methods and equipment used in design, production and fabricating of sheet metal products.
115. **FOUNDRY TECHNOLOGY (1).** LAB. 3. Basic fundamentals involved in casting products of ferrous and non-ferrous metals.
204. **KINEMATICS OF MACHINES (3).** LEC. 2, LAB. 3. Pr., TS 104, 105 and PS 220. Spring. Graphical analysis of machine elements including velocity diagrams.
216. **PLASTICS TECHNOLOGY (2).** LEC. 1, LAB. 2. Pr., TS 100 or equivalent. Laboratory oriented course in material and processes of plastic products.
307. **GENERAL METALS (5).** LEC. 3, LAB. 4. Pr., COI. Design, construction and finishing art metal projects.
308. **GAGES AND MEASUREMENTS (5).** LEC. 4, LAB. 2. The science of measurement as applied to production and inspection of industrial products.
402. **ADVANCED WOODWORKING (5).** LEC. 3, LAB. 4. Pr., TS 111. Design, construction, and finishing fine objects of wood.

405. **PROBLEMS IN WELDING ENGINEERING (5). LEC. 3, LAB. 4. Pr., TS 112.** Advanced phases and techniques of welding and allied processes. Problems in design, weldability of metals, inspection practice, and selection of equipment.
406. **PROBLEMS IN MACHINING (5). LEC. 3, LAB. 4. Pr., TS 113.** Advanced phases of metal machining with emphasis on production machines and accessories.

ADVANCED UNDERGRADUATE AND GRADUATE

515. **SHOP WORK FOR ELEMENTARY TEACHERS (5). LEC. 2, LAB. 6.** Methods, materials, and techniques involved in conducting activity programs in schools and recreational centers.
516. **MATERIALS OF INDUSTRIAL ARTS (5). LEC. 5. Pr., senior standing.** History and use of various materials used in industry.
517. **ORGANIZATION OF SHOP COURSES (5). LEC. 5. Pr., senior standing.** Organization and administration of the Industrial Arts program in the public schools.
518. **INDUSTRIAL ARTS DESIGN (5). Pr., senior standing.** Fundamentals of design as applied to Industrial Arts programs.
550. **ENGINEERING METROLOGY (1-5). Pr., departmental approval.** Design, construction, and use of precision measuring equipment and gages.

GRADUATE

- 611-612. **TECHNICAL PROBLEMS IN INDUSTRIAL ARTS (5-5). Pr., graduate standing.** Advanced study of technology and methods in selected areas of Industrial Education.

Textile Engineering (TE)

Professors Lynch, Head, Hall, and Waters
Associate Professors Broughton, Perkins, and Walker
Assistant Professor Whitley
Instructor Smith

Basic Textiles

101. **INTRODUCTION TO TEXTILES (3).** An introduction to the textile industry. The industry, its products, business and manufacturing structures, careers and education programs.
141. **TEXTILE CHEMISTRY (5). LEC. 4, LAB. 2. Pr., TE 101.** The discipline of science is presented to assist the student in making the transition from secondary to post secondary study of the physical sciences. Production and modification of textile products with chemistry.
211. **YARN FORMING SYSTEMS (5). LEC. 4, LAB 2. Pr., TE 101.** Forming of staple and filament yarns. Interactions between raw materials and manufacturing systems that create specified product characteristics.
221. **FABRIC FORMING SYSTEMS (5). LEC. 4, LAB 2. Pr., TE 101.** The basic forming systems for textile fabrics including knit, woven and non-woven structures.
231. **TEXTILE FIBERS I (5). LEC. 4, LAB 2. Pr., TE 141.** Natural and man-made fibers, their production, structure and properties. The relationship between polymeric fibrous materials, end products and utilization.

Intermediate Textiles

241. **DYEING AND FINISHING OF TEXTILE MATERIALS (5). LEC. 4, LAB 2. Pr., TE 141, CH 104.** Emphasis on principles and techniques to modify textile materials by coloration, additives and surface treatment. The chemistry of these phenomena is studied.
212. **SPECIAL TOPICS ON YARN MANUFACTURING (4). LEC. 3, LAB. 2. Pr., all Basic Textile Courses.** An extension of TE 211. Mechanics of yarns, geometry and properties of yarns as influenced by processing techniques. Both conventional and non-conventional processes are explored.
213. **PREPARATION OF YARNS FOR FABRIC FORMING (2). LEC. 2. Pr., all Basic Textile Courses.** Yarn packaging and sizing for further processing; chemistry of sizing materials; management aspects of yarn preparation and effects on yarn properties and process efficiency are covered.
222. **WOVEN STRUCTURES (3). LEC. 2, LAB 2. Pr., all Basic Textile Courses.** Looms and loom mechanisms are covered including cam, dobb, jacquard and shuttleless machines. The principles of operation, process efficiency and fabric quality are emphasized. Constraints of each system are included.

232. **TEXTILE FIBERS II (5). LEC. 4, LAB. 2.** Pr., all Basic Textile Courses. An extension of Textile Fibers I. Provides an in-depth analysis of physical and chemical structure and resulting properties of textile fibers. Application of fiber theory to practical manufacturing situations.
242. **CHEMICAL TECHNOLOGY OF BLEACHING, DYEING AND FINISHING (3). LEC. 2, LAB. 2.** Pr., all Basic Textile Courses, TE 241. Bleaching, dyeing and finishing of fabrics made from natural and man-made fibers; dyes and pigments for textiles, their chemical structure and utility.
311. **TEXTURIZED YARNS (2).** Pr., all Basic Textile Courses. Methods and principles of science applied to the modification of continuous multifilament textile yarns to alter their characteristics. Preparation of textured and non-textured yarns is presented.
321. **KNIT STRUCTURES (3). LEC. 2, LAB 2.** Pr., all Basic Textile Courses. Principles involved in the formation of knit structures. The scope of capability-design and mechanical constraints, quality and relation between input materials and product characteristics is included.
322. **NON CONVENTIONAL FABRIC STRUCTURES (3).** Pr., all Basic Textile Courses. Methods of fabric forming other than conventional weaving or knitting are surveyed. More emphasis is placed on specific methods of greater economic significance.
342. **ANALYTICAL INSTRUMENTATION IN TEXTILES (3). LEC. 2, LAB 2.** Pr., all Basic Textile Courses, TE 241. Use of specialized analytical instrumentation to assist in the production of textile products; as means to solve problems of color mixing, waste water characterization, dust measurement and the identification of materials. Systems control by instrumentation is also included.

Advanced Undergraduate Textiles

325. **DESIGN OF TEXTILE FABRICS (4). LEC. 2, LAB. 4.** Pr., all Intermediate Textile Courses. Technical fabric design drafts for woven and knit structures are studied. Patterns are developed on production machines. Problems of cost, material and people utilization as influenced by product design are presented.
350. **TESTING OF TEXTILE MATERIALS (5). LEC. 3, LAB 4.** Pr., all Intermediate Textile Courses. Basic principles of measuring the physical and chemical properties of natural and man-made textile materials; includes supplementary laboratory experiments.
351. **ANALYSIS OF TEXTILE FABRIC STRUCTURES (5). LEC. 3, LAB 4.** Pr., all Intermediate Textile Courses, TE 325. Analysis of textile fabrics, including woven, knit and non-conventional structures formed from the interlacings of primary materials. The student will make a technical, economic and manufacturing plan for the production of such materials.
352. **TEXTILE QUALITY CONTROL (3).** Pr., IE 220, TE 350. The practical application of quality control in the textile industry with emphasis on statistical control techniques. Areas covered include measures of variation, statistical quality control charts, sample size, confidence interval, significance testing, correlation, and analysis of variance.
380. **TEXTILE COSTING (5).** Pr., all Intermediate Textile Courses, TE 325, ACF 215. Application of accounting principles in the determination of product cost and profit analysis. The making of managerial decisions related to product mix, material utilization, and the allocation of resources to the manufacturing of textile products.
421. **JACQUARD WEAVING AND DESIGN (2). LEC. 1, LAB. 2.** Pr., all Intermediate Textile Courses. Jacquard mechanism and design of original patterns for jacquard loom.
441. **APPLIED DYEING THEORY (5). LEC. 4, LAB. 2.** Pr., all Intermediate Textile Courses. Dye film bonding; thermodynamics and kinetics of dyeing.
- 480-481. **PLANT DESIGN, OPERATION AND CONTROL I & II (4). LEC. 4, AND (4). LEC. 3, LAB. 2.** Pr., TE 480 (TE 490), TE 481, (TE 491). A two quarter sequence in planning, operation and control of a textile manufacturing plant. Includes the problem of plant changeover, changing product mix, technical requirements, constraints, use of resources, plant location and design, changing markets and emerging technology.
482. **TEXTILE MANAGEMENT (3).** Pr., all Intermediate Textile Courses. A practical business management approach to the analysis and solution of problems in the textile industry. The major areas of concern to management are discussed, including policy determination, organization structure and analysis, employment function, manpower development, financing purchasing, production, merchandising, industrial and public relations, etc.
- 490-491. **UNDERGRADUATE RESEARCH I, II, (5), (5).** Pr., Inter. Textiles, TE 351, 352. A two quarter sequence in undergraduate research.

Theatre (TH)

Professors Angotti, *Head*, and Harrison
Associate Professor Miller
Assistant Professors Fuselier and Hamlin
Instructor Sayre

100. **THEATRE CONVOCATION (0). ALL QUARTERS.** Required of all theatre majors each quarter. Performance, lectures, and discussions by faculty, guest artists, and students.
104. **INTRODUCTION TO THEATRE I (3).** Theatre as an art form, involving history and crafts of theatre and the solution of simple problems in theatre production.

105. **INTRODUCTION TO THEATRE II (3).** Stagecraft theory and practice including all elements of technical theatre.
106. **INTRODUCTION OF THEATRE III (3).** Pr., TH 104, 105. Theatre as an art form, involving the exploration and beginning development of the voice and body as instruments of the theatre.
- 107-108-109. **STAGECRAFT (1-1-1).** Practical experience in scenery and costume construction, stage lighting and sound.
111. **THEATRE PRACTICE (1). LAB. 3.** For work in University Theatre activities. One hour's credit in any field of theatre—acting, directing, technical production, design, or theatre management—in any one quarter. Total credit allowed: six hours.
112. **ACTING, REHEARSAL, AND PERFORMANCE (1). LAB.** For performance in Auburn University Theatre productions. One hour's credit in any one quarter. May be repeated for a maximum of six quarter hours credit.
199. **THEATRE LABORATORY (2). LAB. 6.** Open to students interested in working on the theatre season of the Department in any production capacity. May be repeated for a maximum credit of six quarter hours.
201. **CONTEMPORARY AMERICAN THEATRE (3).** An examination of the history of professional theatre in the U.S. and the development of regional and educational theatre.
203. **THEORIES OF ACTING (3).** The theoretical aspects of acting to include writings from the time of Aristotle to the present day.
204. **ACTING FUNDAMENTALS I. (5). LAB. 10.** Developing the voice as a performing instrument.
205. **ACTING FUNDAMENTALS II. (5). LAB. 10.** Pr., TH 204. Developing the body as a performing instrument.
206. **ACTING FUNDAMENTALS III. (5). LAB. 10.** Pr., 204, 205, or equivalent. Developing the integrated use of voice and movement as performing instruments in building characterizations in short acting sequences.
207. **STAGE MAKE-UP (3). LAB. 4.** A practical course in the design and application of theatrical make-up for stage purposes.
210. **THEATRE AS ENTERTAINMENT (3). LEC. 3.** Not open to Theatre majors. Developing the student's awareness of theatre through involvement in the processes and materials used by various performing arts: theatre, film, television, music, and dance.
221. **ADVANCED TECHNICAL PRODUCTION (3).** Pr., TH 107, 108, 109. Stagecraft with emphasis on the various physical forms of theatre, and the construction, rigging, handling of scenery, and machinery for each.
301. **THEATRE IN WESTERN CIVILIZATION (3).** Theatre history from the beginnings through the Middle Ages.
302. **THEATRE IN WESTERN CIVILIZATION (3).** Theatre history from the Renaissance to 1850.
303. **THEATRE IN WESTERN CIVILIZATION (3).** Theatre history from 1850 to the present.
304. **FUNDAMENTALS OF STAGE DESIGN (5). LAB. 6.** Pr. The basic considerations involved in all aspects of the performer's stage environment.
305. **DESIGN IN THE THEATRE I (3). LAB. 6.** Pr., 304 or equivalent. A continuation of fundamental design concepts.
306. **DESIGN IN THE THEATRE II (3). LAB. 6.** Pr., 304, 305 or equivalent. Practice in stage design.
307. **CHILDREN'S THEATRE (3).** Theatre for children involving an examination of play scripts, acting, and production techniques.
308. **CREATIVE DRAMATICS (3).** Leadership principles in creative dramatics: story materials and their adaptation to children's needs; techniques for guiding, planning, leading, and evaluating improvised drama; emphasis on creative dramatics as a learning tool in the classroom.
309. **COSTUME (3).** The design and construction of elementary stage costumes.
- 310-311-312. **DRAMATIC PRODUCTION (3-3-3).** Only students approved by the department head may register for these courses. For advanced work on individual projects. A maximum of six hours credit may be earned in Dramatic Production.
315. **RECREATIONAL DRAMATICS (3).** Fundamentals of amateur theatrical production: techniques of staging, simple scenery, costuming, lighting, and make-up. Basic techniques of directing and acting for teacher, club, and recreation leader.
321. **COSTUME HISTORY (3).** The history of clothing in Western Civilization from the ancient Egyptians to the present, with special emphasis upon theatrical uses of styles and accessories.
322. **COSTUME DESIGN (3). LAB. 6.** Pr., 321. The basic considerations involved in all aspects of the performer's stage dress, with particular stress on designing for Shakespearean plays, opera, and contemporary musical comedy.
323. **COSTUME PATTERNING AND CONSTRUCTION (3). LAB. 6.** Pr., 321, 322. A continuation of costume design, with emphasis on working from prepared patterns, drafting original patterns, and selecting fabrics, trims, and accessories.
326. **STAGE LIGHTING (3). LAB. 6.** Introduction to stage lighting and operation of the light control board. Survey of the history, nature, and control of light in the theatre through color media, reflection, refraction, and dimmers. Assignments and practice in Auburn University Theatre productions.

331. **SUMMER THEATRE REHEARSAL AND PERFORMANCE (5).** Theoretical and practical study in analyzing and performing dramatic characters. Designed for individual artistic development through acting opportunities in rehearsals and performance of major play productions.
332. **SUMMER THEATRE MANAGEMENT (5).** Intensive practical participation in non-technical production planning, box office procedures, publicity preparation, and stage management applied in major play production.
401. **PLAY ANALYSIS (3).** An examination of playscripts emphasizing interpretation from the viewpoint of directorial theory.
403. **SEMINAR AND THEATRE RESEARCH (3).** The past and present patterns of research in all areas of theatre and practice.
404. **DIRECTING FUNDAMENTALS I (3). LAB. 4.** Introduction to basic theory and technique of directing theatre productions.
405. **DIRECTING FUNDAMENTALS II (3). LAB. 6. Pr., TH 401, 404.** A continuation of 404 involving practical exercises in directing.
406. **DIRECTING FUNDAMENTALS III (3). LAB. 6. Pr., TH 405.** Provides the student with several directing problems which must be solved through the completion of a directing project.
407. **ADVANCED ACTING (5). LAB. 10. Pr., TH 206.** Developing the various specialized performance and vocal techniques required for acting dramas from the major periods preceding the twentieth century.
408. **PROBLEMS IN AESTHETIC DESIGN (5). LAB. 10.** An intensive study of design problems based on the works of design theoreticians of the twentieth century.
409. **ADVANCED DIRECTING (3).** Pr., 404, 405, or equivalent. Directing theory based on the detailed analysis of the work and writings of selected twentieth century directors.
- 410-411-412. **DRAMATIC PRODUCTION (3-3-3).** Only students approved by the department head may register for these courses. For advanced work on individual projects. A maximum of six hours credit may be earned in Dramatic Production.
414. **MODERN THEATRE BACKGROUNDS (3).** The leading artists, concepts, and movements in Continental theatre which have affected playwrighting and play production in the twentieth century.
427. **INTRODUCTION TO THEATRE MANAGEMENT (5).** An introduction to the field of theatre management with emphasis on elementary procedures involving sales and advertising management.
431. **SUMMER THEATRE PRODUCTION (5).** Intensive experience in all phases of technical theatre production through participation in scenic construction, lighting, sound, and costuming in the production of major plays.
432. **SCENE PAINTING (3).** Pr., TH 304, 305, 306. Introduction to painting for the stage, with emphasis on materials, texturing techniques, and three-dimensional effects.

Veterinary Medicine (VM)

Anatomy and Histology

Professor Holloway, *Head*

Associate Professor Krista and Buxton

Assistant Professors Gray, Reynolds, Rumph, Garrett, Ireland, and Vaden
Instructor Cooper

Microbiology

Professors Kramer, *Head*, Rossi, Schnurrenberger, and Shultz

Associate Professors Attleberger, Swango, and Swann

Adjunct Associate Professor Klesius

Adjunct Assistant Professor Christenberry

Adjunct Instructors Brown, Coker, and Lisiak

Pathology and Parasitology

Professors Groth, *Head*, Morgan, Bailey, Benz, Moore, Mitchell, and Powers

Associate Professors Hoff, Teer, Miller, Spano, and Kwapien

Assistant Professors Diamond and Fisher

Adjunct Associate Professors Ernst and Frandsen

Instructor D'Andrea

Physiology and Pharmacology

Professors Clark, *Head*, Redding, Beckett, Burns, and Ganjam
Associate Professor Robertson
Assistant Professors Branch and Pedersoli

Radiology

Professor Bartels, *Head*
Assistant Professor Pechman
Instructors Brawner and Byron
Adjunct Asst. Professor Lo

Large Animal Surgery and Medicine

Professors Walker, *Head*, Hudson, Kiesel, and Wiggins
Adjunct Professor Montes
Associate Professors Winkler, Humburg, Hoover, and Purohit
Assistant Professors Powe, Sharman, Carson, and Brown
Instructors Bowman, B. Hudson, Jagar, Jones, Slone, Bergfeld,
Smith, and Riddell
Adjunct Associate Professor Kjar

Small Animal Surgery and Medicine

Professors Hoerlein, *Head*, Horne, Redding, and Hanks
Associate Professors Albert and Swaim
Assistant Professors Ball, Braund, Dillon, Henderson, Vandervelde, August, Luttgen,
Wiggins, Milton, Pidgeon, and Mansfield
Instructor Bowman
Adjunct Professor Hughston
Adjunct Instructor Sorjonen
Resident Veterinary Surgeon Shires

Veterinary Medicine (VM)

Following this section of Veterinary Medicine Course Descriptions, the remaining VM courses are listed under their alphabetically arranged departments.

300. ORIENTATION (2). Fall. Dynamics of professional responsibilities, duties and privileges of the veterinarian.
313. PHYSIOLOGY I (4). LEC. 4. Fall. Cell physiology and respiratory physiology.
- 313L. PHYSIOLOGY LABORATORY I (1). LAB. 2. Fall. Experiments on cell physiology and reproductive physiology.
314. PHYSIOLOGY II (2). LEC. 2. Pr., VM 313-313L. Fall. Reproductive physiology.
315. PHYSIOLOGY III (2). LEC. 2. Pr., VM 314. Winter. Gastrointestinal and liver physiology.
- 315L. PHYSIOLOGY LABORATORY II (2). LAB. 4. Winter. Experiments on the endocrine, cardiovascular, and digestive systems.
316. PHYSIOLOGY IV (2). LEC. 2. Pr., VM 315-315L. Winter. Endocrinology.
317. PHYSIOLOGY V (2). LEC. 2. Pr., VM 315-315L. Winter. Blood, electrocardiology.
318. PHYSIOLOGY VI (4). LEC. 4. Spring. Cardiovascular and renal physiology.
- 318L. PHYSIOLOGY LAB. III (1). LAB. 2. Spring. Physiology and Pharmacology experiments on the cardiovascular system and the kidney.
319. PHARMACOLOGY I (2). LEC. 2. Pr., VM 318. Spring. Introductory pharmacology.

- 320-321-322. ANATOMY I, II, III (5-5-5). LEC. 2, LAB. 10.** Fall, Winter, Spring. Gross anatomy of domestic animals. A progressive study of the gross structures of the dog, cat, ox, horse, hog, fowl, laboratory animals, and zoo animals.
- 326. MICROSCOPIC ANATOMY I (5). LEC. 2, LAB. 6.** Fall. Microscopic anatomy of the form, structure, and characteristics of the basic tissues of animals.
- 327. MICROSCOPIC ANATOMY II (5). LEC. 2, LAB. 6.** Pr., VM 326. Winter. Microscopic anatomy of the tissue, composition of organs and organ systems.
- 328. MICROSCOPIC ANATOMY III (4). LEC. 2, LAB. 4.** Pr., VM 327. Spring. Microscopic anatomy of the reproductive organs. Formation and early development of the embryos of domestic animals. Fetal membranes and placentation are emphasized.
- 331. VETERINARY MICROBIOLOGY I (4). LEC. 3, LAB. 2.** Spring. Veterinary Immunology for students in Veterinary Medicine.
- 401. PHARMACOLOGY II (3). LEC. 2, LAB. 2.** Pr., VM 319. Fall. Pharmacology of general anesthetics.
- 402. PHARMACOLOGY III (4). LEC. 3, LAB. 2.** Pr., VM 401. Winter. Systematic pharmacology.
- 403. PHYSIOLOGY VII (4). LEC. 3, LAB. 2.** Pr., VM 318-319. Fall. Neurology, respiratory physiology and the pharmacodynamics of drugs affecting the central nervous system.
- 404. PHYSIOLOGY VIII (3). LEC. 2, LAB. 2.** Pr., VM 403. Winter. Neurology, and the pharmacodynamics of drugs affecting the central nervous system and radiobiology.
- 405. PATHOLOGY I (6). LEC. 4, LAB. 4.** Pr., VM 322 and 328. Fall. Disease processes affecting animals with emphasis on the gross and microscopic changes in cells, tissue organs, and systems.
- 406. PATHOLOGY II (5). LEC. 3, LAB. 4.** Pr., VM 405. Winter. Continuation of VM 405.
- 407. PATHOLOGY III (4). LEC. 3, LAB. 2.** Pr., VM 406. Spring. Continuation of VM 406.
- 408. LABORATORY ANIMAL MEDICINE (3). LEC. 2, LAB. 2.** Pr., VM 405 and 406. Spring. Management, utilization, and disease of the common laboratory mammals including rats, mice, guinea pigs, hamsters, rabbits, and nonhuman primates.
- 409. VETERINARY PARASITOLOGY I (4). LEC. 3, LAB. 2.** Fall. Introduction to parasitology including internal and external parasites of domestic animals.
- 410. VETERINARY PARASITOLOGY II (5). LEC. 4, LAB. 2.** Pr., VM 409. Winter. Continuation of VM 409.
- 411. VETERINARY MICROBIOLOGY II (6). LEC. 3, LAB. 6.** Pr., VM 331. Fall. Bacteriology and Mycology of Veterinary Pathogens.
- 412. VETERINARY MICROBIOLOGY III (5). LEC. 3, LAB. 4.** Pr., VM 331 and 411. Winter. Veterinary Virology. Rickettsiology and chlamydia are considered briefly.
- 413. PREVENTIVE MEDICINE (4). LEC. 4.** Spring. Principles of epidemiology, preventive medicine, and environmental health, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies.
- 414. VETERINARY MEDICINE I (5). LEC. 5.** Spring. Detailed etiology, symptoms, pathogenesis, diagnosis, treatment, and prevention of the medical diseases affecting the various systems and organs of the equine, bovine, ovine and porcine species.
- 420. VETERINARY MEDICINE II (5). LEC. 5.** Fall. Continuation of VM 414 and includes nutritional deficiency diseases.
- 421. VETERINARY SURGERY I (3). LEC. 3.** Fall. Background of surgery; major surgical injuries—wounds, fluid loss and infection; preoperative and postoperative care; surgical techniques; anesthesia; and extirpative, reconstructive and physiologic surgery.
- 422. VETERINARY SURGERY II (3). LEC. 3.** Winter. Special surgical diseases of the domestic farm animals including surgery of the alimentary canal, the chest and abdomen, the respiratory and cardiovascular systems, the eye and ear, the genito-urinary tract, and the feet and limbs.
- 423. CLINICAL PATHOLOGY (5). LEC. 5.** Pr., VM 407. Spring. Methods for the collection, preservation and examination of various body fluids including blood and urine. Interpretation of results is directed toward clinical diagnosis and prognosis.
- 424. VETERINARY MEDICINE & SURGERY I (5).** Fall. The diagnostics, medical and surgical treatment of the gastrointestinal, genitourinary, cardiovascular, pulmonary, and integumentary systems of small domestic animals.
- 425. VETERINARY MEDICINE & SURGERY II (5).** Pr., VM 424. Winter. The diagnostics, medical, and surgical treatment of the endocrine, musculo-skeletal, nervous systems and the special sense organs in small domestic animals.
- 426. VETERINARY SURGERY III (1). LAB. 2.** Pr., VM 424. Winter. Introductory laboratory on basic surgical asepsis, anesthesia, and techniques.
- 427. VETERINARY MEDICINE & SURGERY III (3). LEC. 3.** Pr., VM 424-425. Fall. The systemic diseases and clinical immunologic procedures in small domestic animals.

428. **DIAGNOSTIC CLINICS I (1). LAB. 2.** Fall. Demonstration and application of principles and techniques of physical diagnosis of large animals.
429. **CLINICS VI (1). LAB. 2.** Fall. Demonstration and practice of handling, restraint, physical diagnosis, and administration of therapeutic agents related to small animals.
430. **VETERINARY JURISPRUDENCE AND ETHICS (2).** Winter. Laws relating to the veterinary profession. Professional ethics for the veterinarian.
431. **VETERINARY RADIOLOGY (4). LEC. 4.** Fall. Basic diagnostic radiology including interpretations, techniques, therapy and equipment.
433. **THERAPEUTIC CLINICS I (1). LAB. 2.** Winter. Demonstration and application of therapeutic techniques and procedures for large animals.
434. **APPLIED ANATOMY (1). LAB. 2.** Winter. Anatomy related to diagnostic, obstetrical, and surgical procedures.
435. **THERIOGENOLOGY (4). LEC. 5.** Spring. Clinical application of the physiology of reproduction, causes and correction of dystocia, genital examinations, and infertility of the male and female.
436. **SPECIAL ANATOMY (1-5). (HOURS AND CREDIT TO BE ARRANGED.) Pr., VM 320.** Elective course in which any phase of anatomy of domestic animals to the anticipated field on specialization may be studied.
437. **VETERINARY MEDICINE III (5).** Summer. Identification and study of selected poisonous plants of the U.S. and common chemical and venom poisoning of farm animals and pets. To include characteristic signs, lesions, methods of diagnosis, and treatment.
- 438-439. **VETERINARY MEDICINE IV, V (4-5).** Winter, Fall. Principal infectious diseases of large domestic animals. Epizootiology, etiology, clinical signs, diagnosis and diseases control including immunization and sanitation.
- 440-441-442-443. **CLINICS VII, VIII, IX, X (7-7-7-7).** Spring, Summer, Fall, Winter. Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases of small domestic animals.
- 444-445-446-447. **CLINICS AND LARGE ANIMAL SURGERY AND THERIOGENOLOGICAL EXERCISES II, III, IV, V (7-7-7-7). LAB. (12-18-17-18).** Spring, Summer, Fall, Winter. Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases and surgical procedures for large domestic animals.
- 448-449-450. **VETERINARY SURGERY IV, V, VI (1-1-1). LAB. 2.** Spring, Summer, Fall. Detailed consideration and performance of advanced small animal surgery.
451. **VETERINARY PUBLIC HEALTH II (2). LEC. 2. Pr., VM 411.** Winter. Principles and methodology of food hygiene including meat, milk, poultry, and other foods related to animal and human health.
452. **VETERINARY PUBLIC HEALTH III (2). LEC. 2. Pr., VM 451.** Winter. A continuation of VM 451.
453. **SEMINAR (2).** Each quarter. Literature reviews or research problems selected by the student. Papers written and oral presentation given before his class and faculty.
454. **PRECEPTORSHIP (0). NON-CREDIT REQUIRED COURSE.** Spring. Completion of satisfactory preceptorship during the spring quarter is required for graduation.
455. **PHYSICAL DIAGNOSIS II (1). LAB. 2.** A continuation of VM 429. Winter.
460. **INTRODUCTORY CLINICS (1-2). LAB. 4.** Introduction to the clinical practice of large and/or small animal medicine.

Anatomy and Histology (VAH)

570. **HISTOLOGICAL TECHNIQUES (2-5).** Pr., COI. Quarter by arrangement. Detailed techniques employed in the preparation of cytological and histological materials.

GRADUATE

621. **CARDIOVASCULAR ANATOMY (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Structure of the cardiovascular system. Comparative developmental, and gerontologic phases emphasized.
622. **A COMPARATIVE STUDY OF THE UROGENITAL SYSTEM IN ANIMALS (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Structure of the urinary and genital systems.
623. **NEUROANATOMY (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Structure of the central and peripheral nervous systems.
624. **EXPERIMENTAL NEUROANATOMY (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Use of the Horsley-Clark stereotaxic instrument and other experimental neuroanatomical procedures.
625. **ANATOMY OF THE LOCOMOTOR SYSTEM (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Dissection of the structures of the locomotor system. The horse is utilized as the primary model.
626. **ANATOMY OF THE SPECIAL SENSES (5). LEC. 2, LAB. 9.** Pr., COI. Quarter by arrangement. Taste, smell, sight, and hearing. Macroscopic and microscopic specimens are utilized to correlate structure and function.
627. **ADVANCED HISTOLOGY OF DOMESTIC ANIMALS (5). LEC. 2, LAB. 6.** Pr., COI. Quarter by arrangement. The basic tissues. The light microscope and electron micrographs are utilized to interpret morphology.

628. **ADVANCED ORGANOLOGY OF DOMESTIC ANIMALS (5). LEC. 2, LAB. 6.** Pr., COI. Quarter by arrangement. Organs and organ systems, utilizing the light microscope and electron micrographs to interpret morphology.
696. **SEMINAR (1). QUARTER BY ARRANGEMENT.** Required of all graduate students who major in Veterinary Anatomy and Histology.
698. **RESEARCH PROBLEMS (2 TO 5). QUARTER AND CREDIT BY ARRANGEMENT.**
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Large Animal Surgery and Medicine (VLA)

GRADUATE

- 651-2-3. **ADVANCED LARGE ANIMAL SURGERY (5-5-5). LEC. 1, LAB. 8.** Any quarter by arrangement. Research in surgery. Advanced techniques for surgical procedures in the domestic animals.
- 654-655. **ADVANCED LARGE ANIMAL MEDICINE (5-5). LEC. 1, LAB. 8.** Any quarter by arrangement. The causes, methods of diagnosis, treatment and methods of control and education of selected non-surgical diseases of domestic animals.
657. **GYNECOLOGY OF LARGE DOMESTIC ANIMALS (5).** Any quarter by appointment. Functional and infectious conditions affecting female reproduction.
658. **ANDROLOGY OF LARGE DOMESTIC ANIMALS (5).** Any quarter by arrangement. Functional and infectious conditions affecting breeding sires.
659. **ADVANCED VETERINARY ANESTHESIOLOGY (5). LEC. 3, LAB. 4.** Pr., COI and Graduate Standing. Summer. Advanced anesthetic principles and uses of various anesthetic agents in veterinary medicine with emphasis on clinical monitoring of physiological parameters and intensive care of critical patients.
660. **HEALTH MAINTENANCE OF FOOD ANIMALS (5). LEC. 5.** Pr., Graduate Standing and COI. Any Quarter by Arrangement. Advanced principles of health maintenance of food and fiber animals emphasizing sustenance of the health state rather than the employment of restorative or preventive medicine.
696. **SEMINAR (1). REQUIRED OF ALL GRADUATE STUDENTS IN LARGE ANIMAL SURGERY AND MEDICINE.** Meets at scheduled intervals each year.
698. **RESEARCH PROBLEMS (2-5). CREDIT TO BE ARRANGED.**
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Microbiology (VMI)

GRADUATE

501. **VETERINARY MICROBIOLOGY II (6). LEC. 3, LAB. 6.** COI. Fall. Bacteriology and Mycology of Veterinary Pathogens. Same as VM 411.
502. **VETERINARY MICROBIOLOGY III (5). LEC. 3, LAB. 4.** COI. Winter. Animal viruses, pathogenesis of viral diseases, viral oncology and host responses to viral infections and tumors. Chlamydia and rickettsia are considered briefly. Same as VM 412.
503. **VETERINARY PUBLIC HEALTH (4). LEC. 3, LAB. 2.** COI. Spring. Principles of epidemiology, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies. Same as VM 413.
536. **TISSUE CULTURE TECHNIQUES AND APPLIED VIROLOGY (3). LEC. 1, LAB. 5.** Pr., COI. Fall, and junior standing. Fall. Fundamentals of mammalian tissue and cell culture with respect to the importance of water quality, media and buffers, glassware, plasticware; procedures of washing and sterilizing labware and equipment; techniques of primary tissue culture and the culture of continuous cell lines; and methods for the study of virus in cell cultures.
601. **DETERMINATIVE VETERINARY BACTERIOLOGY (5). LEC. 3, LAB. 4.** COI. Quarter by arrangement. Identification, classification, nomenclature, distribution and systematic relationship of bacteria of veterinary significance. The historical background, literature of bacterial taxonomy and rules of nomenclature will be considered.
602. **BACTERIAL PATHOGENESIS (5). LEC. 5.** COI. Quarter by arrangement. How bacteria cause disease. The cellular and subcellular basis for bacterial pathogenesis. Study of bacterial toxins, host/bacteria interaction, mixed bacterial and bacterial-viral infections.
604. **IMMUNOBIOLOGY (5). LEC. 5.** COI. Quarter by arrangement. The biologic basis of the immune response. Immunocompetent cells. Various types of immune responses. Hypersensitivities, blood and tissue antigens, histocompatibility and immunogenetics.

605. **IMMUNOLOGY OF INFECTIOUS DISEASES (5). LEC. 5.** COI. Summer and Fall. The immune mechanism to selected models of human and animal infectious diseases.
606. **BOVINE VIROLOGY (5). LEC. 3, LAB. 4.** COI. Bovine viruses and the diseases they produce. Laboratory work includes techniques of studying bovine viruses and evaluating the resistance of the bovine to viral diseases.
607. **PATHOGENESIS OF VIRUS DISEASES OF ANIMALS (5). LEC. 5.** COI. How animal viruses produce disease in their hosts. Various well-studied models are used to demonstrate current theories and knowledge of pathogenetic mechanisms of virus-induced neurological diseases, enteric diseases, respiratory diseases, immune complex diseases, and neoplastic diseases.
608. **ADVANCED EPIDEMIOLOGY (5). LEC. 2, LAB. 6.** COI. Quarter by arrangement. Advanced techniques in epidemiological investigation, their application to diseases of man and animals for control purpose.
609. **MEDICAL MYCOLOGY (5). LEC. 3, LAB. 4.** COI and acceptable courses in bacteriology. Quarter by arrangement. Methods and techniques used in isolating and propagating yeasts, molds, and actinomycetes pathogenic for animals. Laboratory diagnosis of fungus infections in animals.
696. **SEMINAR (1).** Quarter by arrangement. Required of all graduate students who major in Veterinary Microbiology.
698. **RESEARCH PROBLEMS (2-5). QUARTER AND CREDIT BY ARRANGEMENT.**
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

Pathology and Parasitology (VPP)

ADVANCED UNDERGRADUATE AND GRADUATE

518. **GENERAL PATHOLOGY (5). LEC. 3, LAB. 4.** Pr., Satisfactory courses in histology and physiology. Fall quarter. The fundamental alterations of disease, adapted for especially qualified graduate students. (Not available for candidates for M.S. in Vet. Med.)
567. **GROSS PATHOLOGY* (2).** Lab. 6. Pr., VM 407, and COI. Any quarter by arrangement. Regular participation in the necropsy examinations under the supervision of senior staff members. Gives the graduate student experience in necropsy procedures and in diagnostic-interpretation of gross lesions.
575. **SPECIAL TECHNIQUES IN HISTOPATHOLOGY* (3). LAB. 9.** Pr., VM 407, VAH 570. Any quarter by arrangement. Special stains and techniques of histochemistry employed in the preparation of materials for histopathologic study.

GRADUATE

601. **PATHOLOGY (2-5). LEC. 2, LAB. 9.** Pr., D.V.M. degree or equivalent, COI. Any quarter by arrangement. May be taken more than 1 quarter for a maximum of 10 credits in M.S. program or 20 credits in Ph.D. program. Mechanisms of response in domestic animals to diseases, the description and recognition of lesions, and other topics to meet the particular needs of students.
610. **PATHOLOGY OF NUTRITIONAL AND METABOLIC DISEASES (3). LEC. 2, LAB. 2.** Pr., D.V.M. degree or VM 518 or equivalent and COI. The pathogenesis, physiopathology, and morphologic pathology of nutritional and metabolic diseases of domestic and laboratory animals.
614. **ONCOLOGY* (5). LEC. 1, LAB. 8.** Pr., VPP 575. Any quarter by arrangement. Gross and microscopic pathology of neoplasms of domestic animals.
618. **HISTOCHEMISTRY (5). LEC. 2, LAB. 6.** Pr., CH 419, VPP 518, COI. Any quarter by arrangement. Evaluation and application of histochemical methods in the localization of cellular constituents.
622. **COMPARATIVE NEUROPATHOLOGY (5). LEC. 2, LAB. 6.** Pr., D.V.M. degree or equivalent, VAH 623, VPH 633, and COI. Any quarter by arrangement. Principles of pathologic processes affecting the nervous system of animals.
826. **EXOTIC DISEASES (5). LEC. 2, LAB. 6.** Pr., D.V.M. degree or equivalent, COI. Any quarter by arrangement. Principles of pathogenesis and disease pattern recognition in animal diseases not endemic in the U. S.
630. **ANIMAL MODELS FOR BIOMEDICAL RESEARCH (5). LEC. 2, LAB. 6.** Pr., D.V.M. degree or equivalent and COI. Any quarter by arrangement. Principles of disease processes in domestic and laboratory animals for use as experimental models in biomedical research.
650. **ADVANCED CLINICAL PATHOLOGY I* (5). LEC. 4.** Pr., VM 423 or equivalent. Spring quarter. A comprehensive evaluation of diseases altering the lymphohematopoietic system.
651. **ADVANCED CLINICAL PATHOLOGY II* (5). LEC. 2, LAB. 3.** Pr., VM 423 or equivalent. Fall. The concepts relating modern laboratory investigations to disease pattern recognition.
654. **CLINICAL ONCOLOGY* (5). LEC. 5.** Concepts useful in the diagnosis and treatment of neoplastic diseases.

*Available only to students who hold the D.V.M.

670. **VETERINARY PROTOZOOLOGY (5).** LEC. 3, LAB. 4. Pr., VM 410 or ZY 511, COI. Any quarter by arrangement. Pathogenesis, diagnosis, therapy, and other topics relating to selected diseases of veterinary importance caused by protozoan parasites.
- 674-675. **VETERINARY HELMINTHOLOGY (5-5).** LEC. 3, LAB. 4. Pr., VM 410 or ZY 511 or equivalent. Any quarter by arrangement. Pathogenesis, diagnosis, therapy, and other topics relating to selected diseases of veterinary importance caused by helminth parasites.
678. **PATHOLOGY OF PARASITIC DISEASES (5).** LEC. 2, LAB. 6. Pr., VPP 518, COI. Any quarter by arrangement. Gross and microscopic pathology of parasitic diseases of veterinary importance.
696. **SEMINAR (1).** Required of all graduate students with a major in veterinary Pathology and Parasitology. Any quarter by arrangement.
698. **RESEARCH PROBLEMS (2-5).** CREDIT TO BE ARRANGED.
699. **RESEARCH AND THESIS.** CREDIT TO BE ARRANGED.
799. **RESEARCH AND DISSERTATION.** CREDIT TO BE ARRANGED.

Physiology and Pharmacology (VPH)

GRADUATE

601. **MEDICAL PHYSIOLOGY I (5).** LEC. 4, LAB. 2. Pr., an acceptable course in physiology. Fall & Spring. Functional analysis of mammalian organ systems with special emphasis on myology, neurology, circulation and respiration. Laboratory exercises will make use of the physiograph to validate physiologic functions.
602. **MEDICAL PHYSIOLOGY II (5).** LEC. 4, LAB. 2. Pr., An acceptable course in physiology. Winter & Summer. A continuation of VPH 601 with special emphasis on digestive, excretory, endocrine and reproductive systems.
605. **RESPIRATORY PHYSIOLOGY (5).** Pr., PH 601. Summer. Respiratory physiology and the physiological aspects of aviation, space and deep sea diving.
610. **EXPERIMENTAL PHYSIOLOGICAL TECHNIQUES (5).** LEC. 3, LAB. 6. Pr., COI. Spring. Anesthetic and surgical techniques used in many research procedures. Not for veterinary students.
631. **ADVANCED RENAL AND HEPATIC PHYSIOLOGY (5).** LEC. 4, LAB. 3. Pr., VPH 602. Summer. The physiology of the liver and kidney and the effects that certain disease processes have on these organs.
632. **ADVANCED ENDOCRINOLOGY AND REPRODUCTION (5).** LEC. 4, LAB. 3. Pr., VPH 602. Fall. The endocrine and reproductive systems of domestic animals in both health and disease.
633. **ADVANCED NEUROLOGY (5).** LEC. 4, LAB. 3. Pr., VPH 601. Winter. The physiology of the mammalian nervous system. Considerable emphasis will be placed on the physiological explanation of abnormalities and the use of the electroencephalogram.
635. **VETERINARY PHARMACOLOGY I (5).** LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Spring. Principles and mechanisms of drug action; passage of drugs across biologic barriers; mechanisms of absorption, distribution, biotransformation, and their effects on neurohumoral transmission. Drugs affecting the autonomic nervous system and muscle relaxants will be discussed.
636. **VETERINARY PHARMACOLOGY II (5).** LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Fall. Drugs of veterinary interest acting on the central nervous system. Basic principles of general anesthesia, general anesthetic agents, neuroleptanalgesics, dissociative anesthesia, narcotics and tranquilizers.
637. **VETERINARY PHARMACOLOGY III (5).** LEC. 4, LAB. 2. Pr., acceptable course in physiology or pharmacology. Winter. Drugs of veterinary interest that are used on the cardiovascular, digestive, reproductive and urinary systems will be discussed. Antibacterial drugs, antiseptics, insecticides and anthelmintics will also be included.
638. **PHYSIOLOGY OF DIGESTION (5).** LEC. 5. Pr., VPH 602. Spring. Enzymatic and bacterial digestion as well as the motility of the gastrointestinal tract in farm animals.
639. **SMALL ANIMAL NUTRITION (5).** LEC. 4, LAB. 3. Any quarter by arrangement. Pr., COI and acceptable courses in physiology. Requirement of amino acids, fats, carbohydrates, minerals and vitamins for dogs, cats and other small animals. Nutritional antagonists and symptoms of nutritional deficiencies in the animals.
645. **CARDIOLOGY (5).** Pr., VPH 601. Fall. The physiology of the heart and advanced techniques used in electrocardiology.
696. **SEMINAR (1).** Required of all graduate students in this department.
698. **RESEARCH PROBLEMS (2-5).** CREDIT TO BE ARRANGED.
699. **RESEARCH AND THESIS.** CREDIT TO BE ARRANGED.
799. **DOCTORAL RESEARCH AND DISSERTATION.** CREDIT TO BE ARRANGED.

Small Animal Surgery and Medicine (VSA)

ADVANCED UNDERGRADUATE AND GRADUATE

Candidates for a master's degree in the School of Veterinary Medicine may be required to pass a preliminary oral or written examination to demonstrate adequate knowledge in their chosen fields. They must meet the general requirements for admission into the Graduate School.

580. **RADIOLOGICAL TECHNIQUES (5). LEC. 3, LAB. 4.** Any quarter by arrangement. Detailed radiographic techniques including assignments on basic radiation physics.
647. **CANINE NEUROSURGERY* (5). LEC. 2, LAB. 6. Pr., COI.** Any quarter by arrangement. The applied anatomy, physiology, physical and radiographic diagnosis, and surgical correction of lesions (especially those of traumatic origin) affecting the nervous system of the dog.
659. **ADVANCED VETERINARY ANESTHESIOLOGY (5). LEC. 3, LAB. 4. Pr., COI and Graduate Standing.** Summer. Advanced anesthetic principles and uses of various anesthetic agents in veterinary medicine with emphasis on clinical monitoring of physiological parameters and intensive care of critical patients.
660. **ADVANCED SMALL ANIMAL SURGERY* (5). LEC. 1, LAB. 10.** Any quarter by arrangement. Techniques in general small animal surgery.
662. **ADVANCED SMALL ANIMAL ORTHOPEDIC SURGERY* (5). LEC. 1, LAB. 10.** Any quarter by arrangement. New techniques in general orthopedic surgery.
663. **ADVANCED VETERINARY OPHTHALMOLOGY I. GENERAL OPHTHALMOLOGY (5). LEC. 3, LAB. 4.** Any quarter by arrangement. Advanced general techniques of diagnosis, medication and surgical techniques necessary for veterinary ophthalmology.
- 664-665. **ADVANCED SMALL ANIMAL MEDICINE* (5-5). LEC. 1, LAB. 10.** Any quarter by arrangement. The causes, methods of diagnosis, treatment and control of non-surgical diseases of small animals.
666. **ADVANCED CANINE NEUROLOGY* (5). LEC. 3, LAB. 6.** Any quarter by arrangement. The neurodiagnostics and non-surgical therapy of neurological disorder in small domestic animals.
667. **NORMAL RADIOLOGICAL ANATOMY (5). LEC. 4, LAB. 2.** Any quarter by arrangement. The normal structure, size and position of the various organs as they appear on flat and contrast radiographs.
668. **ADVANCED RADIOLOGY* (5). LEC. 1, LAB. 8.** Any quarter by arrangement. Advanced radiographic techniques including fluoroscopy, uses of contrast mediums and the principles of image intensification and cineradiography.
669. **RADIOLOGICAL INTERPRETATIONS* (5). LEC. 1, LAB. 8.** Any quarter by arrangement. Radiological interpretation of pathological lesions of domestic animals.
671. **SMALL ANIMAL CARDIOVASCULAR SURGERY (5). LEC. 1, LAB. 10.** Any quarter by arrangement. Application of accepted, as well as the recently developed techniques of cardiovascular surgery.
672. **ADVANCED VETERINARY OPHTHALMOLOGY II. INSTRUMENTATION (5). LEC. 2, LAB. 6. Pr.,** any quarter by arrangement. Emphasis is placed on the use of advanced instrumentation necessary for the diagnosis and treatment of ocular disease.
673. **ADVANCED VETERINARY OPHTHALMOLOGY III. ADVANCED OPHTHALMIC MEDICINE (5). LEC. 3, LAB. 4. Pr., VSA 672.** Any quarter by arrangement. Ophthalmology with emphasis on diagnosis and treatment of ocular diseases.
674. **ADVANCED VETERINARY OPHTHALMOLOGY IV. ADVANCED OPHTHALMIC SURGICAL TECHNIQUE. (5). LEC. 2, LAB. 6. Pr., VSA 673.** Quarter by arrangement. Ophthalmology with emphasis on ophthalmic surgery.
696. **SEMINAR (1).** Required of all graduate students in Veterinary Medicine. Meets regularly at scheduled intervals each year during Summer Quarter.
698. **RESEARCH PROBLEMS (2-5). CREDIT TO BE ARRANGED.**
699. **RESEARCH AND THESIS. CREDIT TO BE ARRANGED.**
799. **RESEARCH AND DISSERTATION. CREDIT TO BE ARRANGED.**

*Available only to students who hold the D.V.M.

Vocational and Adult Education (VED)

Professors Baker, Head, Kurth, Montgomery, and Scarborough
 Associate Professors Frank, Iverson, and Sankovsky
 Assistant Professors Bond, Brown, Davis, Drake, Hale,
 Halta, Halverson, Hartzog, Hayes, Johndrow, McCall, Morgan,
 Patterson, Stewart, Terry, Williams, and Wilson
 Instructors Burgess, Street, and White
 Research and Extension Associate Andrews

102. **ORIENTATION FOR TRANSFER STUDENTS (1).** Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
104. **ORIENTATION TO LABORATORY EXPERIENCES FOR TRANSFERS (1).**
200. **TYPEWRITING I (3). LAB. 5.** Mastery of keyboard; techniques of machine operation; basic typewritten applications. For students with no previous training in typewriting. (Students with previous instruction or experience in typewriting should consult with Office Administration staff members for placement.)
201. **TYPEWRITING II* (3). LAB. 5.** Pr., VED 200 with grade of C or one year of high school typewriting. Emphasis on business letters, tabulation, reports.
202. **TYPEWRITING III* (3). LAB. 5.** Pr., VED 201 with grade of C. Advanced typewritten communications with special problems and arrangement.
203. **TYPEWRITING IV* (3). LAB. 5.** Statistical typewriting; composition at the typewriter; executive office projects.
205. **TRANSCRIPTION FUNDAMENTALS (1). LAB. 2.** Pr., VED 200 or COI.
210. **SHORTHAND I* (5).** Pr., VED 200 or equivalent. Basic course in Gregg shorthand. Emphasis on recognition of principles; rapid reading of notes; dictation of new material.
211. **SHORTHAND II* (5).** Pr., VED 210 with grade of C. Reinforcement of principles; speed building dictation; development of transcription skills.
212. **SHORTHAND III* (5).** Pr., VED 211 with grade of C. Emphasis on dictation speed and mailable transcription.
246. **INSTRUCTIONAL DRAWING (3). LAB. 6.** Preparing for the shop laboratory, including making freehand and pictorial sketches and drawings, reading working drawings, blue prints, manufacturers guides, and lettering, use of instruments, dimensioning, making models, floor plans, bills for materials, writing specifications, and developing working plans.
300. **TRANSCRIPTION (5). LEC. 5, LAB. 5.** Pr., VED 212 with grade of C. Emphasis on improved production rates. Continued development of dictation speed. Transcription of letters with special features.
301. **MACHINE TRANSCRIPTION (1). LAB. 2.** Pr., VED 202 or COI. May be taken more than one quarter for specialization not to exceed three credits. Eighteen instructional and performance hours in the production of general business correspondence in mailable form from recorded dictation.
- 302A. **MACHINE TRANSCRIPTION (1) LAB. 2.** Pr., VED 301, 302 OR COI. Eighteen instructional and performance hours in the production of legal papers in mailable form from recorded dictation.
- 302B. **MACHINE TRANSCRIPTION (1). LAB. 2.** Pr., VED 301, 202 or COI. Eighteen instructional and performance hours in the production of medical papers in mailable form from recorded dictation.
305. **RECORDS MANAGEMENT (3).** Basic procedures of filing, records storage and control. Practice in record keeping.
346. **VOCATIONAL AND ADULT EDUCATION.** Principles and Practices (3). Principles of vocational education and their application in developing and operating preparatory and in-service programs.
352. **NOMENCLATURE FOR HEALTH RELATED OCCUPATIONS (5).** Equips the student with the essential medical terminology for effective communication among the various members of the health team.
354. **CAREERS IN HEALTH RELATED OCCUPATIONS (5).** Identification of role and function in health related occupations including the range of occupations that require minimum training as well as those that require University level education.
356. **HEALTH DELIVERY SYSTEMS (5).** Contemporary and emerging patterns in delivering health services.
400. **INTRODUCTION TO POWER MECHANICS (5). LEC. 2, LAB. 6.** Design and operational theories related to power machines. Internal combustion engines; power trains; hydraulic and cooling systems.
401. **PRACTICUM IN SMALL GASOLINE ENGINES (5). LEC. 2, LAB. 6.** Application of skills and abilities needed in teaching the maintenance and repair of small air cooled engines. Theories of compression, carburetion and ignition; laboratory exercises in repair and maintenance.
402. **AUTOMOTIVE CONSTRUCTION AND REPAIR (5). LEC. 2, LAB. 6.** Theories of design, principles of operation, and maintenance and repair of ignition system, fuel systems, power systems and chassis components.

*The shorthand and typewriting sequence should be begun at the highest possible level because credit may be gained through advanced placement. With previous training in either, the student may enter the second, third, or fourth quarter course. If a grade of C or higher is earned, credit is given for the lower courses. If a C is not earned, advanced placement credit will not be granted. Consult with OA staff for placement.

403. **PRINCIPLES OF ELECTRICITY (1). LAB. 3.** An introductory course in the principles and application of elementary laws governing electricity and its use.
404. **PRACTICUM IN GENERAL METALS (5). LEC. 2, LAB. 6.** Application of skills and abilities needed in the teaching of metal processes applicable to vocational education program in the secondary school. Metal properties; power tools; heat treating; ornamental iron work, cold metal; sheet metal, machining metals; and arc and gas welding.
405. **THE SCHOOL SHOP (3).** Organization and management of the school shop; methods and materials integrated with the study of jobs and problems basic to the teaching of skills in vocational education.
406. **PRACTICUM IN BUILDING CONSTRUCTION AND MAINTENANCE (5). LEC. 2, LAB. 6.** Application of skills and abilities needed in teaching the erections of buildings and other related structures.
407. **PRACTICUM IN ELECTRICITY (4). LEC. 2, LAB. 6.** Application of skills and abilities needed in the teaching of fundamental principles of electricity. Planning and developing projects involving an understanding of electrical principles as applied to materials selection, circuits, motors and devices; and maintenance and servicing of electrical equipment and appliances.
409. **TEACHING ELECTRONICS IN INDUSTRIAL ARTS (4). LEC. 2, LAB. 6.** Pr., consent of department head. Theories and practices used in school electronic laboratories; projects designed and constructed.
411. **TEACHING HOME ECONOMICS EDUCATION (5). LEC. 4, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for Home Economics.
412. **PROGRAMS IN HOME ECONOMICS EDUCATION (4). LEC. 3, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Principles of and experience in designing programs for home economics; evaluation of instruction and programs.
414. **PROGRAM IN AREA OF SPECIALIZATION (3). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Program planning principles involved in designing program activities for specific areas of specialization.
415. **TEACHING IN AREA OF SPECIALIZATION (3-5). LEC. 2, LAB. 2.** Pr., admission to Teacher Education and FED 320 or equivalent. Understanding of curriculum content; methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for specific area of specialization.
420. **OFFICE MACHINES (3). LAB. 4, LEC. 1.** Pr., junior standing and COI. Designed to give a working knowledge of various machines found in modern offices. Basic training in the use of adding machines, electronic calculators, duplicating, dictating machines, and posting machines. (Optional rotation in machine transcription, excluding Office Administration majors.)
421. **OFFICE INTERNSHIP (10). LAB. 20.** Pr., VED 422, and senior standing. (Supervised work experience open to OA majors only).
422. **SECRETARIAL PROCEDURES I (3).** Pr., VED 300, and junior standing. Analysis of requirements of profession of executive secretary or administrative assistant.
423. **SECRETARIAL PROCEDURES II (5).** Pr., VED 300, and junior standing. Major activity: The work of several long-term projects in which students benefit from long-range planning, setting of priorities, expediting of solutions to problem situations, and handling volume correspondence.
424. **ADMINISTRATIVE MANAGEMENT (3).** Pr., MN 310 or COI. Management of information in many forms, systems design, data collection and processing methods, communications and records management, office physical facilities, office performance standards and control, and motivation of personnel.
425. **PROFESSIONAL INTERNSHIP (15).** Pr., senior standing, admission to Teacher Education. Provides supervised, on-the-job experiences in a school, college, or other appropriate setting. Evaluation and analysis of the intern experience.
446. **DIRECTED INDEPENDENT STUDY (1-10).** The student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
450. **SPECIAL TOPICS (1-5).** Seniors and professors pursue cooperatively selected concepts and theoretical formulations.
457. **PRACTICUM IN GRAPHIC ARTS INSTRUCTION (3). LAB. 6.** Pr., junior standing. To prepare pre-service and in-service vocational teachers to teach graphic arts skills in printing and duplicating techniques, advertising display, and other modes of graphic communication.
462. **DIRECTED WORK EXPERIENCE IN DISTRIBUTIVE EDUCATION (5). LAB. 10.** Pr., VED 414. In-service. Supervised work experience. Individually designed for part-time and/or summer experience.
466. **TEACHING OUT-OF-SCHOOL GROUPS (3).** Pr., VED 414. Conducting surveys, occupational analysis, using advisory committees, organizing, conducting and supervising various types of adult education.
- 475-476-477-478-479-480. **TRADE AND TECHNICAL EXPERIENCE (5-5-5-5-5-5).** An experience completed by supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to starting the curriculum, elective coursework may be substituted for these credits.
495. **PRACTICUM (1-10).** Provides experiences closely relating theory and practice, usually carried on simultaneously.

ADVANCED UNDERGRADUATE AND GRADUATE

508. **TEACHING MECHANICAL TECHNOLOGY (5).** Objectives and methods; equipment and management of vocational education shops; organization of projects; recent developments in specialized areas of mechanics; in-service teaching problems. Student plans for demonstration of methods for teaching mechanical skills.
510. **OCCUPATIONAL INFORMATION (3). LEC. 2, LAB. 2. Pr., FED 320 or equivalent.** Occupational structure, job qualifications and requirements, sources of occupational information, current trends, industrial and occupational surveys. Preparation, evaluation, and dissemination of occupational information used by teachers in vocational and technical schools.
513. **NATURE OF ADULT EDUCATION (5).** The characteristics of adults as learners and the history, philosophy, and nature of adult education, applied to specific adult groups in developing and implementing adult educational programs in basic, occupational or continuing education. History and principles of adult education as applied to the development and implementation of programs in remedial, occupational and continuing education.
524. **ADMINISTRATIVE MANAGEMENT (5).** Pr., junior standing, COI. Management of information in many forms, systems design, data collection and processing methods, communications and record management, office physical facilities, office performance standards and control, and motivation of personnel.
541. **DEVELOPMENT OF VOCATIONAL EDUCATION (4).** Historical perspective of the development of vocational education with an overview of its nature and purpose relative to the technological society.
550. **CAREER EDUCATION (4).** Introduction career education as a system concept encompassing the entire educational experience in K-14. Emphasis will be given to the interrelated nature of the role of the administrator, the counselor, and the classroom teacher in career education.
552. **INSTRUCTIONAL PROGRAMS IN THE CONSTRUCTION INDUSTRY (4). LEC. 2, LAB. 4. Pr., VED 414 or graduate standing.**
554. **INSTRUCTIONAL PROGRAMS IN THE MANUFACTURING INDUSTRY (4). LEC. 2, LAB. 4. Pr., VED 414 or 415 or graduate standing.**
556. **LEARNING RESOURCES IN AREA OF SPECIALIZATION (4).** Pr., FED 320 or equivalent.
558. **COORDINATION AND SUPERVISION OF VOCATIONAL EDUCATION PROGRAM IN AN AREA OF SPECIALIZATION (5). LEC. 4, LAB. 2.** Develops and maintains appropriate relationship between the school and on-the-job program; records of coordination, student placement; improving employable skills and habits; recruitment and selection of work experience applicants; work experience rotation; public information and other similar activities.
569. **COMMUNITY PROGRAMS IN ADULT EDUCATION (5). LEC. 4, LAB. 2. Pr., VED 413 or COI.** A comprehensive, field centered investigation of Adult Education programs conducted by various organizations, agencies, and groups. Emphasis will be placed upon the curriculum and instructional aspects of the several programs.
574. **ORGANIZATION OF INSTRUCTION IN VOCATIONAL TECHNICAL EDUCATION (5).** Trade and occupational analysis; principles and procedures of identifying and selecting the skills and knowledge needed in the preparation of courses of instruction. Principles and procedures for individualizing instruction.
591. **PROBLEMS IN TEACHING THE DISADVANTAGED ADULT (3-5).** The disadvantaged adult with special emphasis on the unique sociological, psychological and physiological factors that influence learning and participation in remedial learning activities.

GRADUATE

602. **TEACHER EDUCATION IN VOCATIONAL AND ADULT EDUCATION (5).** Designed for supervisors of student teachers, teacher educators and other graduate students. Major emphasis deal with administration of vocational education programs, research, problems which supervising teachers encounter in the student teaching program.
603. **PROBLEMS IN AGRICULTURAL OCCUPATIONS (5).** Securing, organizing and interpreting information for guidance and teaching purposes; curriculum development; developing instruction units and planning teaching activities for on-farm and off-farm occupations.
606. **ORGANIZATION AND UTILIZATION OF COMMUNITY RESOURCES (5).** Processes through which new ideas and innovations are utilized through community organization to maximize the effective use of physical and human resources.
608. **ADMINISTRATION OF VOCATIONAL AND PRACTICAL ARTS EDUCATION (5).** Prepares professional personnel for leadership positions and to relate current social demands to vocationally oriented programs. Content includes philosophy and an application of procedures in administering and supervising new and on-going programs to meet changing socio-economic conditions.
616. **ORGANIZING AND TEACHING ADULT, POST-SECONDARY AND CONTINUING EDUCATION (5).** Pr., COI. Utilization of principles of andragogy in helping adults who are not full-time students benefit from adult, post-secondary, and continuing education.
625. **INTERNSHIP (5-15).** Supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences accompanied by regularly scheduled, on-campus discussion periods for positive evaluation and analysis of the intern experience.

630. **DIAGNOSTIC VOCATIONAL EVALUATION (4).** Pr., PG 415 or equivalent. Process, principles, and techniques used to diagnose general assets and liabilities of the individual. Includes the functional and analysis of biographical data and the use of the evaluation interview. Emphasis is placed upon the rationale underlying the selection and use of psychometric tests in vocational evaluation.
631. **PROGNOSTIC VOCATIONAL EVALUATION (4).** Pr., VED 630 or consent of department head. Process, principles, and techniques used to determine and predict work behavior and vocational potential. Includes the rationale underlying the selection and use of occupational exploration programs, work samples, situational tasks, simulated work experiences, and job tryouts in vocational evaluation.
632. **USE AND INTERPRETATION OF VOCATIONAL EVALUATION DATA (4).** Pr., VED 630 and 631 or COI. Process, principles, and techniques used in the interpretation of vocational evaluation data to clients, to rehabilitation personnel, and to facility staff. Focuses upon the interpretation of data through the formal staff conference, vocational counseling, report writing, and follow-up.
634. **WORK SAMPLE DEVELOPMENT (5).** Pr., COI. Theoretical and technical principles related to the development, standardization, and validation of work samples. Supervised experience in the application of work sample development principles.
646. **DIRECTED INDEPENDENT STUDY (1-6).** The student's learning efforts are guided toward desired objectives including evaluation by professor and student of work accomplished at regular intervals.
650. **SEMINAR IN AREAS OF SPECIALIZATION (1-3), MAY BE REPEATED FOR CREDIT NOT TO EXCEED 10 HOURS.** Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
651. **RESEARCH STUDIES IN EDUCATION IN AREAS OF SPECIALIZATION (5).** Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
652. **CURRICULUM AND TEACHING IN AREAS OF SPECIALIZATION (5).** Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
653. **ORGANIZATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
654. **EVALUATION OF PROGRAM IN AREAS OF SPECIALIZATION (5).** Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.
695. **PRACTICUM. (1-15).** Students get experiences closely relating theory and practice, usually carried on simultaneously.
699. **RESEARCH AND THESIS (CREDIT TO BE ARRANGED).** May be taken more than one quarter.
798. **FIELD PROJECT. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.
799. **RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)** May be taken more than one quarter.

Program Designators—When appropriate, certain sections of the above common offerings are identified by programs within the departments by the use of letter designations as noted below:

(A) Agriculture, (B) Industrial Arts, (C) Trade and Industrial, (D) Distributive, (F) Adult, (G) Technical, (H) Business, (I) Home Economics, (K) Office Administration, and (T) Health Occupations.

Zoology-Entomology (ZY)

Professors Hays, Head, Bass, Berger, Blake, Dusi, Folkerts, Mason, Mount, and Watson
Associate Professors Alexander, Causey, Dixon, Dobie, Harper,
Hyche, Ivey, Kenamer, Kouskolekas, Lisano, Pritchett, Ramsey, Speake, and Williams
Assistant Professors Ball, Bradley, Chalker, Clark, Current, Estes, Gaylor, Hill
Lawrence, Lishak, Mirarchi, Mullen, Slack, and Wit
Instructors Christenberry and Grant

105. **INTRODUCTORY HUMAN PHYSIOLOGY (5).** LEC. 4, LAB 2. Winter, Summer. The organ systems of the human body and their functions. For non-science majors only. Degree credit may not be earned in both ZY 105 and BI 103. This course is designed primarily for Home Economics students.
201. **MARINE BIOLOGY (6).** LEC. 4, LAB. 4. Pr., BI 101, 102, and 103. Summer. The invertebrates, vertebrates, and marine plants as communities with emphasis on local examples. Taught only at Cauphin Island Sea Laboratory. Credit may not be earned in both ZY 201 and 436.
204. **INSECTS (3).** LEC. 3. GENERAL ELECTIVE. Winter. Life processes, occurrence, and importance of insects. Degree credit may not be earned in both ZY 204 and ZY 304 or ZY 502.

205. **WILDLIFE CONSERVATION (3). LEC. 3. GENERAL ELECTIVE.** Fall, Spring. Conservation and natural history of important wildlife animals, especially Alabama species. Degree credit may not be earned in both ZY 205 and ZY 328.
206. **CONSERVATION IN THE UNITED STATES (3). GENERAL ELECTIVE.** Winter, Summer. Basic facts essential to an understanding of current problems pertaining to the conservation of our rapidly depleting natural resources such as soil, water, minerals, forest, and wildlife. Especially planned for elementary and high school teachers.
207. **BIRDS (3). LEC. 3. GENERAL ELECTIVE.** Fall, Summer. Birds in relation to agriculture and game management, recognition of various species, flight, songs, color markings, and feeding habits. Degree credit may not be earned in both ZY 207 and ZY 522.
208. **BIOLOGICAL ISSUES IN HUMAN ECOLOGY (3). LEC. 3.** Winter. The origin, nature, and growth of human populations, emphasizing the role of man in past, present, and future ecosystems. Degree credit may not be earned in both ZY 208 and BI 104.
209. **BEE CULTURE (3). LEC. 2, LAB 3. GENERAL ELECTIVE.** Spring, Summer, Fall. Manipulation and production of bees and honey, and a consideration of bee diseases.
210. **INTRODUCTION TO OCEANOGRAPHY (3). LEC. 3. GENERAL ELECTIVE.** Winter. The earth as a single ecological system, the interrelationship between the continents and the oceans, major features of the physics, chemistry, geology, and biology of the oceans and their importance to man. Degree credit may not be earned in both ZY 210 and ZY 435.
250. **HUMAN ANATOMY (5). LEC. 3, LAB. 6. Pr., BI 101.** All quarters. The structure of the human body combined with a comprehensive study and dissection of a large mammal. Structural similarities and dissimilarities will be emphasized in the laboratory.
251. **PHYSIOLOGY (5). LEC. 4, LAB. 3. Pr., BI 103 or ZY 250.** All quarters. Function of mammalian systems with emphasis on man. Laboratory exercises will provide students with an opportunity to validate functions on laboratory animals.
300. **GENETICS (5). LEC. 4, LAB. 3. Pr., BI 101 and college algebra or equivalent.** Basic genetic principles, theoretical basis for genetic systems, and modern areas of research. Laboratory emphasizes biometrical analysis of experiments using plants and animals. A common laboratory-recitation session will meet on the "fifth day" at the lecture hour, and a two-hour data collecting laboratory will meet in small groups by sections.
301. **COMPARATIVE ANATOMY (5). LEC. 3, LAB. 6. Pr., BI 103.** All quarters. Comparisons of the systems of the vertebrates.
302. **VERTEBRATE EMBRYOLOGY (5). LEC. 3, LAB. 6. Pr., BI 103.** Fall, Winter, Spring. Fertilization, cleavage, morphogenesis, and organogenesis of the frog, chick, pig, and human from a descriptive and analytical viewpoint.
303. **PRINCIPLES OF EVOLUTION AND SYSTEMATICS (5). LEC. 5. Pr., BI 102 or 103.** Winter, Spring, Summer. The major processes, methods, and philosophical basis for present day concepts of evolution and systematics.
304. **GENERAL ENTOMOLOGY (5). LEC. 4, LAB. 3. Pr., BI 103.** Fall, Spring. General characteristics and habits of the orders and families of the Class Insecta.
305. **FOREST ENTOMOLOGY (3). LEC. 2, LAB. 3. Pr., BI 103.** Fall, odd years, Spring. Entomology in relation to insects of forests and forest products, recognition, life histories, and control of major insects of forests.
306. **PRINCIPLES OF ECOLOGY (5). LEC. 4, LAB. 3. Pr., 10 hrs. Biology or COI.** Fall, Spring, Summer. The physical and biotic factors of the environment and the interactions of these with plants and animals. The organization and functions of communities and populations.
307. **INTRODUCTION TO OCEANOGRAPHY (6). LEC. 4, LAB. 4. Pr., college algebra, general chemistry, and general physics.** Summer. The physics, chemistry, biology, and geology of the oceans. Taught only at the Dauphin Island Sea Laboratory. Credit may not be earned in both ZY 307 and ZY 435.
308. **MICROLOGY (5). LEC.-LAB 9. Pr., BI 103 and CH 207-208 or COI.** Fall, Winter, Spring. Laboratory methods of fixation, embedding, sectioning, staining, and mounting of animal tissues, and an introduction to techniques of light microscopy.
310. **CELL BIOLOGY (5). LEC. 4, LAB. 3. Pr., 10 hours of General Biology.** All quarters. Morphology and physiology of cell membranes, cytoplasm, and the formed elements of the cytoplasm and nucleus. Cell division, molecular transport, cellular homeostasis, and biochemical pathways of energy production.
316. **PHYSIOLOGY OF DOMESTIC ANIMALS (5). LEC. 4, LAB. 3. Pr., BI 103.** Fall, Spring. Function of mammalian systems with emphasis on domestic mammals. Degree credit may not be earned in both ZY 316 and ZY 250 or ZY 524.
328. **PRINCIPLES OF GAME MANAGEMENT (5). LEC. 4, LAB. 3. Pr., a course in ecology.** Fall, Spring. Fundamentals of game management theory, application, and administration.
403. **PESTICIDES (5). LEC. 4, LAB. 3. Pr., CH 207.** Winter. The chemistry, mode of action, activity, formulations, applications, safety and legal aspects of pesticides and pesticide application.
405. **APPLIED ENTOMOLOGY (5). LEC. 4, LAB. 3. Pr., ZY 403.** Spring. Biology, economic importance and management of the more important insect pests in each of the various agricultural commodity groups.
406. **INSECT PEST MANAGEMENT (5). LEC. 4, LAB. 3. Pr., ZY 405.** Fall. Methods of incorporating available insect control practices into management systems that will effectively control target pests while minimizing deleterious effects on the environment.

407. **CONCEPTS OF PEST MANAGEMENT (5).** LEC. 4, LAB. 3. Pr., COI. Spring. Pest management technology and philosophy.
410. **MARINE INVERTEBRATE ZOOLOGY I (6).** LEC. 4, LAB. 4. Pr., BI 101 and 103. Summer. The taxonomy, life cycles, ecology, and evolution of the lower invertebrates, Protozoa through Mollusca. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 501.
411. **MARINE INVERTEBRATE ZOOLOGY II (6).** LEC. 4, LAB. 4. Pr., ZY 410. Summer. A continuation of ZY 410 including the Annelida through the Protochordata. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 501.
412. **MARINE VERTEBRATE ZOOLOGY (6).** LEC. 4, LAB. 4. Pr., BI 101, 103 and COI. Summer. The systematics, zoogeography, and ecology of marine fishes, reptiles, and mammals. Taught only at the Dauphin Island Sea Laboratory. This course may not be substituted for ZY 521 and/or ZY 522.
416. **STUDIES AND TECHNIQUES IN FIELD BIOLOGY AND ECOLOGY (10).** Pr., major or minor in a biological field, COI; junior standing. Summer, odd years. A field trip away from the southeastern United States. Practical experience in the collection and preservation of specimens. Studies of basic ecological phenomena in a field situation. Stops at institutions to visit outstanding biologists and see field biology research in action. May not be taken concurrently with other courses. A fee, varying with the nature and extent of the trip, will be charged.
425. **FOREST WILDLIFE MANAGEMENT (3).** LEC. 3. Pr., FY 520 or COI. Winter. Wildlife management as applied to forest properties. Restricted to students in forestry.
433. **FISH AND WILDLIFE LAW ENFORCEMENT (3).** LEC. 3. Pr., junior standing. Spring, odd years. Basic principles and techniques of fish and wildlife laws and law enforcement. Restricted to students in Fisheries or Wildlife Management.
435. **GENERAL OCEANOGRAPHY (3).** LEC. 3. Pr., acceptable physics, chemistry, and mathematics background. Winter. Physical, chemical, and geological characteristics of the oceans, especially as they relate to present understanding of marine ecology and the biological productivity of marine waters.
436. **MARINE BIOLOGY (3).** LEC. 3. Pr., invertebrate zoology, general physiology. Spring. Marine organisms, their physiological adaptations to the environment, with emphasis on respiration, nutrition and feeding, osmoregulation, reproduction, and biological associations in the context of ecology.
439. **AQUATIC COMMUNITIES (5).** LEC. 2, LAB. 9. Pr., BI 102-3, junior standing. Summer. Environmental relations of the biota of freshwater habitats.
498. **SPECIAL PROBLEMS (1-3).** Pr., senior standing. A. Zoology; B. Entomology; C. Wildlife Management; D. Marine Biology. A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

501. **INVERTEBRATE ZOOLOGY (5).** LEC. 3, LAB. 6. Pr., BI 103. Winter, Summer. Biology, taxonomy, and ecology of invertebrate animals.
502. **ECONOMIC ENTOMOLOGY (5).** LEC. 4, LAB. 3. Fall, Spring, Summer. Consideration of the biological aspects, life histories, and control of insects. Not for graduate credit for students in School of Agriculture departments.
504. **MEDICAL ENTOMOLOGY (5).** LEC. 4, LAB. 3. Pr., ZY 304. Spring, even years. Insects, mites, and other arthropods of medical or public health importance with emphasis on recognition and biology of pest species and the epidemiology of arthropod-borne diseases.
505. **FOREST INSECTS (5).** LEC. 4, LAB. 3. Pr., ZY 304, 305, or 502. Fall, even years. Principal insects of forests and forest products, their importance, taxonomy, bionomics, and control.
507. **GENERAL INSECT MORPHOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 304. Winter. Comparative external anatomy and generalized internal structures of insects; characteristics used in taxonomy will be emphasized.
509. **HISTOLOGY (5).** LEC. 3, LAB. 6. Pr., BI 103. All quarters. Morphology and classification of tissues; arrangement of tissues in organs and systems of vertebrate animals.
510. **SYSTEMATIC ENTOMOLOGY (5).** LEC. 3, LAB. 6. Pr., ZY 304. Spring. Principles of systematics and identification of insects through orders, families, genera, and species.
511. **GENERAL PARASITOLOGY (5).** LEC. 3, LAB. 6. Pr., BI 103. All quarters. Origin, adaptations, physiology, and ecology of parasites. Identification and life histories of representative parasitic protozoa, helminths, and arthropods with emphasis on host-parasite relationships.
515. **LIMNOLOGY (5).** LEC. 3, LAB. 6. Pr., CH 104, PS 205, BI 103. Spring. Biological, chemical, and physical factors affecting aquatic life.
517. **QUANTITATIVE GENETICS (5).** LEC. 4, LAB. 3. Pr., ZY 300, BY 517 or by consultation with instructor. Spring. The description and inheritance mode of traits exhibiting continuous variation; analytical procedures and methodology of computer use in genetics.
518. **NON-MENDELIAN GENETICS (3).** Pr., ZY 300. Fall. Current status of behavioral, cytogenetic, cytoplasmic, developmental, and recombinational genetics.
519. **MOLECULAR GENETICS (3).** Pr., ZY 300. Winter. Current status of molecular genetics, nucleic acids, regulation, mutagenesis, and immunology will be considered.

520. **HUMAN GENETICS (5). LEC. 5, Pr., ZY 300, CH 208.** Spring. Effects of normal and abnormal chromosome complements, the biological interaction of genes, and the effects of mutation and changes in gene frequency on human populations, problems in small sample analysis, biochemical screening of human "carriers," and the prospects for genetic engineering.
521. **VERTEBRATE ZOOLOGY I (5). LEC. 3, LAB. 6, Pr., BI 103.** Fall, Spring, Summer. Taxonomy, ecology, and evolution of fishes, amphibians, and reptiles.
522. **VERTEBRATE ZOOLOGY II (5). LEC. 3, LAB. 6, Pr., BI 103.** Fall, Spring, Summer. Taxonomy, ecology, evolution, and some biological principles of birds and mammals. Laboratory studies in radio-telemetry, bioacoustics, and population dynamics are used in addition to classical vertebrate zoology exercises.
524. **ANIMAL PHYSIOLOGY (5). LEC. 4, LAB. 3, Pr., Biochemistry or ZY 310, CH 208.** All quarters. General physiological principles common to animals of various taxa illustrated with examples that are most demonstrative. An effort is made to include unique physiological adaptations.
528. **WILDLIFE BIOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 328.** Fall, Winter. The ecology of wildlife populations and their relations to natural habitat. Laboratory work will consist of practical exercises designed to acquaint the student with modern methodology and technique in studying wild bird and mammal populations.
531. **WILDLIFE HABITAT ANALYSIS (3). LEC. 1, LAB. 6, Pr., ZY 528, BY 506.** Fall, Summer. Practical exercises in vegetation analysis, utilization studies, aerial photograph interpretation, and cover type mapping.
536. **BIOLOGICAL OCEANOGRAPHY (5). LEC. 5, Pr., ZY 435 or COI.** Spring. Oceanic ecosystems, biological productivity of the oceans, energy transfer in oceanic food chains, and an introduction to biological oceanographic investigation.
538. **GENERAL ICHTHYOLOGY (5). LEC. 3, LAB. 6, Pr., BI 103.** Fall. Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
542. **MARINE FISHERIES MANAGEMENT (6). LEC. 3, LAB. 9, Pr., 18 hrs. of biology including BI 103.** Summer. Fisheries management philosophy, objectives, problems, and principles involved in management decisions. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
543. **MARINE VERTEBRATE ZOOLOGY AND ICHTHYOLOGY (9). LEC. 5, LAB. 12, Pr., 18 hours of biology including BI 103.** Summer only. The marine chordata, including lower groups and the mammals and birds, with most emphasis on the fishes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
545. **MARINE INVERTEBRATE ZOOLOGY (9). LEC. 5, LAB. 12, Pr., 18 hrs. biology including BI 103 and ZY 501.** Summer. The marine invertebrates, especially those of the Mississippi Sound region. Emphasis is placed on the structure, classification, phylogenetic relationships, and functional processes. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
548. **MARINE ECOLOGY (7½). LEC. 3, LAB. 6, Pr., BI 102, ZY 501, and acceptable chemistry.** Summer. The relationship of marine organisms to their environment, and the effects of the environment on the abundance and distribution of marine organisms. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
550. **ZOOGEOGRAPHY OF THE VERTEBRATES (5). LEC. 4, LAB. 3, Pr., ZY 521, or COI.** Spring, even years. Principles of geographic distribution of vertebrate animals.
560. **MAMMALIAN PHYSIOLOGY I (5). LEC. 4, LAB. 3, Pr., CH 208, ZY 250 or equivalent, and ZY 310 or Biochemistry.** Pharmacy students or COI. Fall, Spring. A treatment of cellular bioelectric phenomena, muscle contractility, neurophysiology, and cardiovascular physiology. Laboratory will utilize modern methodology for the observation of physiological fact.
561. **MAMMALIAN PHYSIOLOGY II (5). LEC. 4, LAB. 3, Pr., ZY 560 or equivalent.** Pharmacy students or COI. Winter, Summer. A continuation of ZY 560 with emphasis upon respiratory, renal, digestive, metabolic, and endocrine physiology.
565. **ETHOLOGY (5). LEC. 4, LAB. 3, Pr., ZY 306, 522, 524 or COI.** Spring, even years. Animal behaviors, analysis of their adaptive values, development, and evolution.

GRADUATE

601. **INSECT MORPHOLOGY AND EMBRYOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 507.** Fall. A comparative selected arthropod structures study and a consideration of embryological development and metamorphosis in insects.
602. **ADVANCED INSECT TAXONOMY (5). LEC. 1, LAB. 8, Pr., ZY 510.** Summer, odd years. Principles of systematics including phylogeny with emphasis on a particular group of insects which the student may choose.
603. **INSECT PHYSIOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 524 and ZY 601.** Spring, even years. General and comparative physiology of the organ systems of insects. A minimum of two literature reviews will be made by each student during the quarter.
604. **INSECT TOXICOLOGY (5). LEC. 4, LAB. 3, Winter.** Toxic action of insecticides; analysis, preparation and use of insecticides; spray residues in relation to health; research methods in insect toxicology.
605. **ORNITHOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 522.** Spring. Ecology and behavior of birds.
606. **MAMMALOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 522.** Winter. Taxonomy, ecology, and behavior of mammals.
607. **FARM GAME MANAGEMENT (5). LEC. 3, LAB. 6, Pr., ZY 528.** Winter, odd years. Application of game management theories, techniques, and administration with special emphasis on farm game species. For graduate students majoring in Game Management or Fisheries Management.

608. **FOREST GAME ECOLOGY (5). LEC. 5, Pr., ZY 528.** Summer, even years. Intensive investigations into current aspects of the ecology of the important forest game animals, especially those of the southeastern U.S.
609. **ADVANCED APPLIED ENTOMOLOGY (5). LEC. 4, LAB. 3, Pr., ZY 502.** Fall. Integrated control of the principal insects by environmental, biological, genetic, chemical, and legal means.
610. **IMMATURE FORMS OF INSECTS (5). LEC. 2, LAB. 6, Pr., ZY 510.** Winter. Structure and identification of immature forms of insects; methods of collecting and preserving; development and use of keys for classifying immature insects.
612. **ADVANCED INSECT TOXICOLOGY (5). LEC. 4, LAB. 3, Pr., ZY 604.** Spring, odd years. Mode of action, mode of entry, relation of chemical structure to toxicity, and precision methods of determination of insecticides: recent developments in the field of insecticide chemistry.
613. **INSECT PATHOLOGY (5). LEC. 3, LAB. 4, Pr., BY 300, ZY 502 and COI.** Winter, even years. The microorganisms associated with diseases in insects and their pathological effects on insects and insect populations.
614. **BIOLOGICAL CONTROL OF INSECTS (5). LEC. 4, LAB. 3, Pr., ZY 502.** Spring, odd years. Biology, ecology, classification, and behavior of predators, parasites, and disease agents influencing insect populations. Utilization of biotic agents for management of pest populations.
616. **SYSTEMATIC ICHTHYOLOGY (3). LEC. 1, LAB. 6, Pr., ZY or FAA 538.** Winter, odd years. Fishes of the world: their morphology, distribution and life history. The course stresses individual work with literature and museum specimens.
618. **ADVANCED INVERTEBRATE ZOOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 501 or COI.** Spring, odd years. The biology of minor invertebrate phyla with special emphasis on morphology and taxonomy.
619. **COMPARATIVE INVERTEBRATE PHYSIOLOGY (5). LEC. 4, LAB. 3, Pr., ZY 501 and COI.** Spring, even years. The physiological mechanisms of invertebrates with special emphasis on respiration, excretion, reproduction, locomotion, nutrition, circulation, and behavior.
620. **ARACHNOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 304.** Spring, odd years. Biology, behavior, and systematics of arachnids with major emphasis on spiders and mites.
622. **HISTORY AND LITERATURE OF ZOOLOGY (4). LEC. 3, LAB. 3, Pr., graduate standing.** Fall. A historical review of the classical authors and great works in zoological literature. Laboratory will concentrate on examining and learning to use journals, abstracts, and reference materials in the library.
623. **ORGANIC EVOLUTION (5). Pr., ZY 300.** Fall. Evolutionary principles as illustrated by the various biological disciplines, particularly genetics, paleontology, zoogeography, and systematics in general.
627. **IMMUNOLOGY AND PHYSIOLOGY OF PARASITES (5). LEC. 3, LAB. 6, Pr., ZY 511, BY 300, ZY 524, and COI.** Winter, even years. Immunity mechanisms to infections of protozoan and helminth parasites. Chemical physiology of host-parasite relationship to include nutrition, metabolism, toxicity, and chemotherapy.
629. **ADVANCED QUANTITATIVE GENETICS (5). LEC. 4, LAB. 2, Pr., ZY 517.** Fall, odd years. Advanced concepts of analyzing quantitative genetic characters in plant and animal species.
630. **ADVANCED GENETICS (5). Pr., ZY 300 and ZY 518.** Winter, odd years. Non-Mendelian hereditary systems, regulation of gene action as it influences growth, differentiation, and development; and the status of contemporary genetics research.
631. **BIOCHEMICAL GENETICS (3). Pr., ZY 300, ZY 519, corequisite, ADS 519.** Spring, even years. Gene action on the biochemical level pertaining to metabolism, differentiation, immuno-genetics, and mutagenesis. Emphasis on research in prokaryotic and eukaryotic systems.
632. **HELMINTHOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 511.** Spring. Advanced morphology, physiology, life cycles, and host-parasite relationships of helminths. Opportunity for making extensive literature studies and collections of the parasites of a particular group of animals in which the student is most interested.
634. **PROTOZOOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 511.** Winter, odd years. Free-living and parasitic protozoa important to agriculture, wildlife, and man. Morphology, physiology, reproduction, ecology, and life histories will be emphasized.
635. **FURBEARER AND WATERFOWL MANAGEMENT (5). LEC. 3, LAB. 6, Pr., ZY 528.** Winter, even years. Furbearer and waterfowl resources. Emphasis on problems of management and utilization.
636. **ECOLOGY OF ANIMAL POPULATIONS (4). LEC. 4, Pr., ZY 306.** Winter. Structure, dynamics, and natural regulatory mechanisms of animal populations; survival strategies emphasizing reproduction, competition, and adaptations to environmental changes.
637. **HERPETOLOGY (5). LEC. 1, LAB. 8, Pr., ZY 521.** Spring. The morphology, taxonomy, ecology, and behavior of amphibians and reptiles. Laboratory collecting, preserving, and identification of local specimens will be an important consideration.
644. **PHYSIOLOGY OF THE CELL (3). Pr., ZY 310 and 524.** Fall. Basic physiological processes at the cellular level with the tools and approaches of physical science.
645. **NEUROBIOLOGY (5). LEC. 3, LAB. 6, Pr., ZY 524.** Winter. Morphology, physiology, and evolution of the central, autonomic, and neurohormonal systems of the vertebrate.
646. **RENAL AND DIGESTIVE PHYSIOLOGY (5). LEC. 4, LAB. 3, Pr., ZY 524.** Fall. A comprehensive study of renal and digestive mechanisms.

647. **ENDOCRINOLOGY (5).** Pr., ZY 524 and AH 519. Spring. A comprehensive treatment of the classical and modern literature of endocrinology.
648. **EXPERIMENTAL ENDOCRINOLOGY (5).** Pr., ZY 647 or taken concurrently. Spring. Laboratory studies of endocrine control mechanisms utilizing surgical, bioassay, biochemical assay, histochemical, and autoradiographic methods and techniques.
649. **PHYSIOLOGICAL ECOLOGY (4).** LEC. 3, LAB. 3. Pr., ZY 524 or COI. Winter. The physiological adaptations of animals to the specific physical and biotic environments in which they live.
650. **BIOLOGICAL EFFECTS OF RADIATION (5).** LEC. 3, LAB 6. Pr., ZY 310 or 524 or equivalent, PS 205 and 206 or equivalent, or COI. Summer. An introduction to radiation biology including radiation physics; radiation detection equipment; dosimetry; the effects of ionizing radiation at molecular, cellular, organ, and organismic levels, and radioprotection.
693. **SEMINAR. (CREDIT TO BE ARRANGED.)**
697. **PROBLEMS IN MARINE ZOOLOGY (4-9).** Pr., ZY 542 or 548. All year. Supervised research on specific problems in marine zoology for graduates. Offered only at The Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
698. **SPECIAL PROBLEMS (2-5).** All quarters. A. Zoology; B. Entomology; C. Apiculture; D. Parasitology; E. Physiology; F. Wildlife.
699. **RESEARCH AND THESIS. (CREDIT TO BE ARRANGED.)**
799. **DOCTORAL RESEARCH AND DISSERTATION. (CREDIT TO BE ARRANGED.)**



Faculty and Staff

1979-80

(The parenthetical designation after a faculty member's title indicates his department. The first date after the title indicates the year of first appointment to any position in the institution; the second, the year of appointment to present rank.)

GENERAL ADMINISTRATIVE OFFICERS

- PHILPOTT, HARRY M.**, *President*, 1965. A.B., Washington and Lee; Ph.D., Yale; D.D. (Hon.), Stetson; LL.D. (Hon.), Washington and Lee; LL.D. (Hon.), Florida; LL.D. (Hon.), Alabama; H.D. (Hon.), Samford
- LANHAM, BEN T., JR.**, *Vice President for Administration*, 1939, 1972. B.S., Clemson; M.S., Tennessee; Ph.D., Michigan State
- LITTLETON, TAYLOR D.**, *Vice President for Academic Affairs and Professor (English)*, 1957, 1972. B.S., M.A., Ph.D., Florida State
- CARROLL, CHESTER C.**, *Vice President for Research and Professor (Electrical Engineering)*, 1965, 1972. B.S.E.E., M.S.E.E., Ph.D., Alabama
- BRAMLETT, GENE A.**, *Vice President for Extension and Public Service*, 1975. B.S., Murray State; M.S., Ph.D., Kentucky
- VALLERY, H. F.**, *Assistant to the President*, 1950, 1960. B.A., M.A., Louisiana State; M.A. Ed.D., Columbia
- GRANT, W. HAROLD**, *Special Assistant to the President & Professor (Counselor Education)*, 1957, 1975. B.S., Auburn; Ed.D., Columbia
- BARNES, BENJAMIN B.**, *Director of Computer Center and Associate Professor (Electrical Engineering)*, 1963. B.E.E., Auburn; M.S.E.E., Alabama; Ph.D., Auburn
- BRADBERRY, GEORGE L.**, *Executive Secretary of Alumni Association. Director of Auburn Development Program*, 1951, 1976. B.S., Georgia
- CATER, KATHARINE C.**, *Dean of Student Life and Social Director*, 1946, 1976. A.B., Limestone; M.A., Mercer; M.S., Syracuse; Litt.D., Limestone
- DODGE, ENCEL H.**, *Director of Contract and Grant Development*, 1968. B.S., Purdue; M.S., Washington
- GUERIN, WILLIAM H.**, *Campus Planner and Architect*, 1967. B.Arch., Florida
- HAYLEY, LEE R.**, *Director of Athletics*, 1972. B.S., M.S., Auburn
- HIGHFILL, WILLIAM C.**, *University Librarian*, 1973. A.B., Oklahoma Baptist; M.S., Kansas State Teachers College; Ph.D., Illinois
- KEARNEY, PAUL A.**, *Director of Physical Plant*, 1977. B.S., Kentucky
- LEISCHUCK, GERALD S.**, *Director of Institutional Analysis*, 1963, 1966. A.B., M.A., N. Colorado; Ed.D., Auburn
- SCHULTZ, ROBERT G.**, *Director of University Personnel Services*, 1974. B.A., Florida; M.A., North Carolina
- PARKS, PAUL F.**, *Dean of The Graduate School and Professor (Animal & Dairy Sciences)*, 1965, 1972. B.S., M.S., Auburn; Ph.D., Texas A&M
- RAGAN, T. DREW**, *Dean of Student Affairs*, 1960, 1976. B.S., M.Ed., Auburn; Ed.D., Indiana
- RILEY, RHETT E.**, *Business Manager and Treasurer*, 1963, 1973. B.S., Auburn
- TINCHER, WILBUR A., JR.**, *Dean of Student Services & Professor (Educational Leadership)*, 1958, 1966. A.B., M.A., Ed.D., Kentucky
- WARMAN, JAMES C.**, *Director of Water Resources Research Institute and Associate Professor (Civil Engineering)*, 1965, 1970. A.B., M.S., West Virginia
- WEGENER, EDWARD P.**, *Director of Educational Television*, 1954. B.S., Minnesota
- WHITE, J. HERBERT**, *Director of University Relations*, 1960, 1965. B.S., Auburn

ACADEMIC ADMINISTRATIVE OFFICERS AND FACULTY

- ROUSE, R. DENNIS**, *Dean of School of Agriculture*, 1949, 1972. B.S., M.S., Georgia; Ph.D., Purdue
- MCPHEETERS, E. KEITH**, *Dean of School of Architecture and Fine Arts and Professor (Architecture)*, 1969. B.Arch., Oklahoma State; M.F.A. in Architecture, Princeton
- HOBBS, EDWARD H.**, *Dean of School of Arts and Sciences and Professor (Political Science)*, 1967. A.B., North Carolina; M.A., Alabama; Ph.D., Harvard
- HORTON, GEORGE R., JR.**, *Dean of School of Business and Professor (Marketing and Transportation)*, 1968, 1973. B.S., M.S., Auburn; Ph.D., Virginia

- BLACKBURN, JACK E., *Dean of School of Education*, 1975. B.S., Florida State; M.A. Peabody; Ed.D., New York
- COX, J. GRADY, *Dean of Engineering, Director of Engineering Experiment Station*, 1979. B.S., M.S., Auburn; Ph.D., Purdue
- GALBRAITH, RUTH L., *Dean of School of Home Economics and Professor (Consumer Affairs)*, 1970, 1973. B.S., Ph.D., Purdue
- WOODY, MARY F., *Dean of School of Nursing*, 1979. Nursing Dir., Charity of New Orleans; B.S., M.A., Columbia
- COOPER, BEN F., *Dean of School of Pharmacy & Professor*, 1973. A.B., B.S., M.S., Ph.D., North Carolina
- VAUGHAN, JOHN T., *Dean of School of Veterinary Medicine*, 1974, 1977. D.V.M., M.S., Auburn
- ABNEY, LOUIS O., *Professor (Art)*, 1950, 1967. B.A.A., M.A.A., Auburn
- ACHEE, NICHOLAS, JR., *Assistant Director, Contract and Grant Development*, 1968, 1978. B.A., M.A., M.S.L.S., Louisiana State
- ADAMS, ARTHUR L., JR., *Librarian II (Library)*, 1973. B.A., Iowa; M.L.S., Maryland
- ADAMS, CHRISTINE A., *Instructor (Rehabilitation & Special Education)*, 1972, 1975. B.S., Auburn; M.A., Alabama
- ADAMS, DONALD R., *Student Development Specialist (Student Development Services)*, 1973. B.S., Southern Mississippi; J.D.L., Alabama
- ADAMS, FRED, *Professor (Agronomy & Soils)*, 1955, 1965. B.S., M.S., Louisiana State; Ph.D., California
- ADAMS, FREDERICK P., *Assistant Professor (Management)*, 1973, 1975. B.S.E.E., Auburn; B.S.I.M., Mass. Institute of Technology; M.B.A., Alabama; Ph.D., Florida State
- ADAMS, GWENDOLYN J., *Assistant Professor (Rehab. & Special Education)*, 1969, 1978. B.A., Birmingham-Southern; M.A., Syracuse; Ed.D., Auburn
- ADAMS, JAMES W., *Associate Professor (Marketing & Transportation)*, 1969. B.B.A., M.B.A., D.B.A., Georgia State
- ADAMS, MURRAY, JR., *Assistant Professor (Sociology & Anthropology)*, 1964, 1970. B.A., M.A., Mississippi; Ph.D., Kentucky
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- MAYNOR, HAL W., JR., *Professor Emeritus, Mechanical Engineering, October, 1978. B.S., M.S., D. of Engr., Kentucky*
- McINTYRE, SHERWOOD C., *Professor Emeritus, Psychology, January, 1977. B.A., B.Sc., M.A., Ph.D., Ohio State*
- MCLEOD, FRANCES R., *Associate Professor Emerita, English, July, 1975. A.B., Huntingdon; M.S., Auburn*
- MCMILLAN, MALCOLM C., *Honorary Professor Emeritus, History, January, 1978. A.B., M.A., Alabama; Ph.D., North Carolina*
- METZGER, A.B., *Associate Professor Emeritus, Political Science, August, 1974. B.A., Chattanooga; M.A., Auburn*
- MOORE, E. B., JR., *Professor Emeritus, Educational Administration, September, 1978. A.B., M.B.A., Syracuse; Ed.D., Florida*
- MOORE, JOHN RICHARD, *Professor Emeritus, English, 1964. A.B., Tulane; A.M., Ph.D., Harvard*
- MOORE, OMAR C., *Associate Professor Emeritus, Chemical Engineering, September, 1969. B.S., M.S., Auburn*
- MYLES, WILLIAM R., *Associate Professor Emeritus, Management, September, 1977. B.S., M.A., Pittsburgh*
- NEAL, JAMES E., *Professor Emeritus, Microbiology, December, 1971. B.S., Mississippi State; D.V.M., Auburn; M.S., Texas A&M*
- NEAL, JESSE H., *Professor Emeritus, Agricultural Engineering, August, 1967. B.S., Kansas State; M.S., Minnesota; Ph.D., Missouri*
- NICHOLS, GROVER TYLER, *Associate Professor Emeritus, Electrical Engineering, December, 1973. B.E.E., Auburn; M.S., Georgia Tech*
- NICHOLS, JR., SAMUEL HARDING, *Professor Emeritus, Chemistry, June, 1974. A.B., Centre; M.S., Ph.D., Ohio State*
- ORR, FRANK MARION, *Professor Emeritus, Building Technology, June, 1971. B.S., M.Arch., Auburn*
- OTTIS, KENNETH, *Professor Emeritus, Zoology-Entomology, June, 1973. B.S., Dakota Wesleyan; M.S., Ph.D., Iowa State*
- PARKER, WILLIAM V., *Dean Emeritus of the Graduate School and Professor Emeritus, Mathematics, June, 1972. A.B., M.A., North Carolina; Ph.D., Brown*
- PARTIN, ROBERT L., *Professor Emeritus, History, June, 1970. B.S., Middle Tennessee; M.A., Ph.D., Peabody*
- PATRICK, WALTON R., *Hargis Professor Emeritus, English, January, 1978. B.S., Mississippi State; M.A., Ph.D., Louisiana State*
- PEARSON, ALLEN M., *Professor Emeritus, Zoology-Entomology, December, 1971. B.S., Auburn; M.S., Ph.D., Iowa State*

- PEET, HELEN H., *Librarian III Emerita*, July, 1976. B.A., Mississippi Woman's College; M.A., Tulane
- PERRY, NORMAN, *Professor Emeritus, Mathematics*, September, 1977. A.B., California; M.A., Ph.D., Georgia
- PIERCE, TRUMAN M., *Dean and Professor Emeritus, Education*, July, 1976. Ph.B., Piedmont; M.A., Alabama; Ph.D., Columbia
- POSEY, HENRY G., *Associate Professor Emeritus, Forestry*, July, 1978. B.S.F., M.S.F., North Carolina State
- PUMPHREY, FRED H., *Dean Emeritus, School of Engineering*, June, 1969. B.S., B.E.E., E.E., D.Sc., (hon.), Ohio State
- PUNKE, HAROLD H., *Professor Emeritus, Foundations of Education*, June, 1971. B.S., M.S., Illinois; Ph.D., Chicago
- RASH, JOE M., *Associate Professor Emeritus, Pharmacy*, January, 1975. B.S., Carson-Newman; M.S., Auburn
- RITCHIE, VIRGINIA CORBIN, *Associate Professor Emerita, Home Economics*, June, 1966. B.S., M.S., Kentucky
- ROBERTS, CHARLES S., *Professor Emeritus, Pathology and Parasitology*, August, 1977. D.V.M., Auburn; M.S., Michigan State
- ROBERTSON, FRED R., *Vice President Emeritus, Extension and Professor Emeritus, Political Science*, June, 1978. B.S., M.S., Tennessee; Dr. P.A., Harvard
- ROBINSON, A. JUDE, *Associate Professor Emeritus, Mathematics*, June, 1967. B.S., Clemson; M.A., Emory
- ROGERS, HOWARD T., *Professor Emeritus, Agronomy and Soils*, April, 1976. B.S., Virginia Tech; M.S., Michigan State; Ph.D., Iowa State
- SARVER, JOSEPH B., *Executive Secretary Emeritus, the Alumni Association and Director Emeritus of the Auburn Development Program*, November, 1976. B.S., Auburn
- SAUNDERS, CHARLES RICHARD, *Dean Emeritus, School of Chemistry*, July, 1969. B.S., M.S., Auburn; Ph.D., Nebraska
- SCARSBROOK, CLARENCE E., *Professor Emeritus, Agronomy and Soils*, October, 1978. B.S., Auburn; Ph.D., North Carolina State
- SHELL, FRED G., *Professor Emeritus, Large Animal Surgery and Medicine*, February, 1974. D.V.M., Auburn
- SMITH, E. V., *Dean Emeritus, the School of Agriculture and Director Emeritus of the Agricultural Experiment Station*, June, 1972. B.S., Auburn; M.S., Ph.D., Iowa State
- SMITH, WILLIAM S., *Professor Emeritus, Speech Communication*, September, 1977. B.Ed., N. Illinois; M.A., Ph.D., Stanford
- SPANN, RANSOM D., *Professor Emeritus, Electrical Engineering*, June, 1964. B.S.E.E., E.E., Auburn
- SPIDLE, MARION WALKER, *Dean Emerita, School of Home Economics*, June, 1966. B.S., Alabama; B.S., M.A., Columbia
- STALNAKER, CARROLL C., *Associate Professor Emeritus, Accounting and Finance*, September, 1973. B.A., Iowa State; M.A., Iowa
- STURKIE, D. G., *Professor Emeritus, Agronomy and Soils*, July, 1968. B.S., Auburn; M.S., Iowa State; Ph.D., Michigan State
- SYKES, MALTBY, *Professor Emeritus, Art*, June, 1977. Studied with Wyman Adams, Diego Riviera, John Sloan, George C. Miller, Fernand Leger, Stanley William Hayter, and Andre Lhote
- THOMPSON, SIDNEY LEE, *Associate Professor Emeritus, Mathematics*, June, 1976. B.S., Birmingham-Southern; M.S., Tulane; M.A., Michigan
- TURNER, LOUISE K., *Associate Professor Emerita, Health, Physical Education and Recreation*, September, 1975. B.A., Southwestern University; M.A., M.S., Louisiana State; Ph.D., New York
- TURNER, DEWEY M., *Associate Professor Emeritus, Animal and Dairy Sciences*, December, 1972. B.S., Auburn; M.S., Illinois
- UMBACH, A. W., *Professor and Wrestling Coach Emeritus*, August, 1973. B.S., Southwestern State Teachers; M.A., Colorado State Education
- VAN DE MARK, MILDRED S., *Professor Emerita, Home Economics*, March, 1973. B.S., Auburn; M.S., Columbia
- WALL, MINNIE, *Librarian III Emerita*, July, 1978. A.B., Tift; B.S.L.S., Peabody; M.Ed., Auburn
- WARD, BENJAMIN P., *Associate Professor Emeritus, Mechanical Engineering*, July, 1968. B.S., U.S. Naval Academy; M.S.E., Columbia
- WARE, LAMAR MIMS, *Professor Emeritus, Horticulture*, June, 1966. B.S., M.S., Auburn
- WHITE, RAYMOND H., *Professor Emeritus, Education*, April, 1965. B.S., Southwest Missouri; A.B., Drury; A.M., Chicago; Ed.D., Columbia
- WILLIAMS, ERNEST, *Professor Emeritus, Mathematics*, June, 1976. B.S., Birmingham-Southern; M.S., Auburn; Ph.D., Michigan
- WINGARD, ROBERT EUGENE, *Professor Emeritus, Chemical Engineering*, October, 1974. B.S., M.S., Auburn
- YOUNG, LUTHER M., *Associate Professor Emeritus, Health, Physical Education, and Recreation*, January, 1977. B.S., M.S., Auburn

STATE REGULATORY AND VETERINARY SERVICES

STATE REGULATORY SERVICE

CHEMISTRY

GUTHERY, MILFORD DALTON, *Director*, 1966, 1972. B.S., M.S., Auburn
 RHOADES, REGINA A., *Agricultural Chemist II*, 1961, 1967. B.S., Auburn
 HAYES, MELVIN, *Agricultural Chemist II*, 1966, 1968. B.S., West Virginia
 HAYES, ROSE MAE, *Agricultural Chemist II*, 1967, 1973. B.S., N. Alabama
 OWEN, MARJORIE E., *Agricultural Chemist I*, 1972. B.S., N. Alabama
 JINKS, JOHN D., *Chemist II*, 1968. B.S., Auburn
 BOULWARE, PAUL, *Chemist I*, 1970. B.S., M.S., Auburn
 AYCOCK, BOBBY W., *Assistant Chemist*, 1975. B.S., Auburn

STATE VETERINARY DIAGNOSTIC LABORATORY

*(Conducted in cooperation with the Alabama State Department of Agriculture
 and
 Industries and the United States Department of Agriculture,
 Agricultural Research Service.)*

VAUGHAN, JOHN T., *Dean (School of Veterinary Med.)* 1974, 1977. D.V.M., M.S., Auburn
 TAYLOR, JULIAN B., *State Veterinarian*, 1945, 1977. D.V.M., Auburn
 MITCHELL, FRANK, *Assistant State Veterinarian & Director (State Diagnostic Laboratory)*, 1947, 1963. D.V.M., Auburn; M.S., Michigan State
 LONG, IRL RICHARD, JR., *Microbiologist (State Diagnostic Laboratory)*, 1966. A.B. Huntingdon
 ELLIS, ALFRED C., *Microbiologist (State Diagnostic Laboratory)*, 1973. B.S., Jacksonville State; M.S., Samford
 CHRISTENBERRY, C.C., *Brucellosis Epidemiologist (U.S. Dept. of Agriculture, Agricultural Research Service)*, 1966. B.S., D.V.M., M.S., Auburn
 HAYNES, BARRY, *In Charge of Bang's Disease Laboratory (Alabama Department of Agriculture & Industries)*, 1973. B.S., N. Alabama
 WILLIAMSON, O.B., *Biological Laboratory Aide, U.S. Dept. of Agriculture, Agricultural Research Service*, 1955
 WILLIAMSON, RUTH, *Biological Laboratory Aide, U.S. Department of Agriculture, Agricultural Research Service*, 1957
 POOLE, JAMES H., *In Charge of State Veterinary Diagnostic Laboratory, Albertville, Alabama*, 1964. D.V.M., Auburn
 HARDIN, BOYD, *Microbiologist (State Veterinary Diagnostic Laboratory, Albertville, Alabama)*, 1973
 MILLER, T.M., *Director of State Veterinary Diagnostic Laboratory, Elba, Alabama*, 1960. D.V.M., Auburn
 MARTIN, JAMES, *Microbiologist (State Veterinary Diagnostic Laboratory, Elba, Alabama)*, 1973
 MOODY, HAROLD M., *Microbiologist, State Veterinary Diagnostic Laboratory, Elba, Alabama*, 1955, 1962. B.S., Troy State

AGRICULTURAL EXPERIMENT STATION STAFF¹

HARRY M. PHILPOTT, A. B., Ph.D., D.D., LL.D., *President*
 BEN T. LANHAM, JR., B.S., M.S., Ph.D., *Vice President for Administration*
 CHESTER C. CARROLL, B.S.E.E., M.S.E.E., Ph.D., *Vice President for Research*
 R. DENNIS ROUSE, B.S., M.S., Ph.D., *Director*
 STANLEY P. WILSON, B.S., M.S., Ph.D., *Associate Director*
 CHARLES F. SIMMONS, B.S., M.S., Ph.D., *Assistant Director*
 TOM E. CORLEY, B.S., M.S., *Assistant Director*
 WILLIAM J. ALVERSON, B.S., M.Ed., *Assistant to the Director*
 LELLAND S. DRISCOLL, B.S., M.S., *Assistant to the Director*
 EDWIN V. SMITH, B.S., M.S., Ph.D., *Director Emeritus*

AGRICULTURAL ECONOMICS AND RURAL SOCIOLOGY

YEAGER, J. H., *Professor and Head of Department*, 1951, 1964. B.S., M.S., Auburn; Ph.D., Purdue
 *GRIESSMAN, B.E., *Alumni Professor (Sociology)*, 1970. B.A., Tennessee Temple; M.A., Baylor; B.D., New Orleans Theological Seminary; Ph.D., Louisiana State
 BELL, S. C., *Professor*, 1956, 1971. B.S., M.S., Auburn; Ph.D., Michigan State; J.D., Jones Law
 WHITE, MORRIS, *Professor*, 1950, 1960. B.S., Auburn; M.S., Ph.D., Purdue
 WILSON, L. E., *Professor*, 1960, 1968. B.S., Murray State; M.S., Kentucky; Ph.D., Illinois
 CLONTS, HOWARD A., JR., *Associate Professor*, 1962, 1973. B.S., M.S., Auburn; Ph.D., Virginia Tech
 DUNKELBERGER, J. E., *Associate Professor*, 1962, 1967. A.B., Franklin and Marshall; M.S., Pennsylvania State; Ph.D., Mississippi State
 MCCOY, EDWARD W., *Associate Professor*, 1967, 1972. B.S., M.S., Nevada; Ph.D., Tennessee
 STALLINGS, JAMES L., *Associate Professor*, 1969. B.S., M.S., Purdue; Ph.D., Michigan State
 HARDY, WILLIAM E., JR., *Associate Professor*, 1972, 1977. B.S., M.S., Ph.D., Virginia Tech
 MARTIN, NEIL R., JR., *Associate Professor*, 1977. B.S., M.S., Auburn; Ph.D., Illinois
 ADRIAN, JOHN L., JR., *Assistant Professor*, 1974. B.A.A., M.S., Auburn; Ph.D., Tennessee
 MOLNAR, JOSEPH J., *Assistant Professor*, 1976. B.A., M.A., Kent State; Ph.D., Iowa State
 VANLANDINGHAM, CALVIN L., *Assistant Professor*, 1968. B.A., Millsaps; M.A., Ph.D., Mississippi State
 HARRISON, GEORGE L., *Research Associate*, 1978. B.S., Florida
 LICHTKOPPLER, RICHARD J., *Research Associate*, 1978. B.S., M.S., Ohio State
 NELSON, ROBERT G., *Research Associate*, 1977. B.S., Oregon State; M.S., Auburn
 PUROHIT, SALLY R., *Research Associate*, 1976. B.A., M.A., Auburn
 QUERIN, SCOTT F., *Research Associate*, 1978. B.S., Georgia
 THOMAS, JOSEPH G., JR., *Research Associate*, 1977. B.S., Mississippi State; M.S., Kansas State

AGRICULTURAL ENGINEERING

TURNQUIST, P.K., *Professor and Head of Department*, 1977. B.S., Kansas State; M.S., Ph.D., Oklahoma State
 RENOLL, E. S., *Professor*, 1949, 1972. B.S., Auburn; M.S., Iowa State
 BUSCH, CHARLES D., *Associate Professor*, 1969. B.A., Cornell; M.S., Utah State; Ph.D., Cornell
 DUMAS, W. T., *Associate Professor*, 1946, 1962. B.S., M.S., Auburn
 KOON, JOE L., *Associate Professor*, 1967, 1975. B.S., M.S., Ph.D., Auburn
 STOKES, C. M., *Associate Professor*, 1937, 1947. B.S., M.S., Auburn
 FLOOD, C. A., JR., *Assistant Professor*, 1971. B.S., Florida; M.S., Kentucky; Ph.D., Purdue
 ROCHESTER, E. W., JR., *Associate Professor*, 1978. B.S., Clemson; M.S., Ph.D., North Carolina State
 OAKES, P. C., *Research Associate*, 1978. B.S., Auburn
 SINGLETON, D. P., *Research Associate*, 1977. B.S., Auburn
 YOUNG, S.C., *Research Associate*, 1977. B.S., Clemson
 GILL, W. R., *Director, National Tillage Machinery Laboratory (Coop. USDA)*, 1955, 1970. B.S., Pennsylvania State; M.S., Hawaii; Ph.D., Cornell
 BAILEY, A. C., *Agricultural Engineer (Coop. USDA)*, 1965. B.S., Michigan State; M.S., Illinois; Ph.D., Auburn
 BROWNING, VIRGIL D., *Agricultural Engineer (Coop. USDA)*, 1966, 1969. B.S., Auburn
 BURT, EDDIE C., *Agricultural Engineer (Coop. USDA)*, 1968. B.S., Georgia; Ph.D., Auburn
 HENDERICK, J. G., *Agricultural Engineer (Coop. USDA)*, 1962, 1968. B.S., M.S., Auburn; Ph.D., Michigan State
 PICKERING, W. DAVID, *Agricultural Engineer (Coop. USDA)*, 1976. B.S., Mississippi State
 REAVES, C. A., *Agricultural Engineer (Coop. USDA)*, 1951. B.S., Auburn; M.S., Missouri; Ph.D., Auburn
 SCHAFFER, R. L., *Agricultural Engineer (Coop. USDA)*, 1964. B.S., M.S., Ph.D., Iowa State
 TAYLOR, J. H., *Agricultural Engineer (Coop. USDA)*, 1962, 1964. B.S., Mississippi State; Ph.D., Auburn
 TROUSE, A. C., JR., *Soil Scientist (Coop. USDA)*, 1964. B.S., M.S., California; Ph.D., Hawaii

¹As of January 1, 1979.

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AGRONOMY AND SOILS

- WARD, C. Y., *Professor and Head of Department*, 1979. B.S., M.S., Texas Tech; Ph.D., Virginia Tech
- ADAMS, FRED, *Professor*, 1955, 1965. B.S., M.S., Louisiana State; Ph.D., California
- BUCHANAN, GALE A., *Alumni Professor*, 1965, 1970. B.S., M.S., Florida; Ph.D., Iowa State
- COPE, J. T., JR., *Professor*, 1950, 1959. B.S., M.S., Auburn; Ph.D., Cornell
- DONNELLY, E. D., *Professor*, 1946, 1959. B.S., M.S., Auburn; Ph.D., Cornell
- HAJEK, B. F., *Professor*, 1968, 1978. B.S., Texas A&M; M.S., Ph.D., Auburn
- HILTBOLD, A. E., *Professor*, 1955, 1968. B.S., Cornell; M.S., Iowa State; Ph.D., Cornell
- HOVELAND, CARL S., *Professor*, 1959, 1968. B.S., M.S., Wisconsin; Ph.D., Florida
- JOHNSON, WILEY C., JR., *Professor*, 1957, 1969. B.S., Wake Forest; B.S., M.S., North Carolina State; Ph.D., Cornell
- KING, C. C., JR., *Professor*, 1952, 1975. B.S., M.S., Auburn; Ph.D., North Carolina State
- DICKENS, RAY, *Associate Professor*, 1965, 1973. B.S., Arkansas; M.S., Ph.D., Auburn
- EVANS, C. E., *Associate Professor*, 1955, 1970. B.S., Abilene Christian; M.S., Auburn; Ph.D., North Carolina State
- EVANS, E. M., *Associate Professor*, 1949, 1953. B.S., Auburn; M.S., Cornell
- THURLOW, D. L., *Associate Professor*, 1967. B.S., M.S., Kansas State; Ph.D., Michigan State
- BOCK, B. R., *Assistant Professor*, 1978. B.S., M.S., Kansas State; Ph.D., Nebraska
- DANE, JACOB, *Assistant Professor*, 1976. B.S., State Agricultural, Wageningen, The Netherlands; M.Sc., Mexico State; Ph.D., Colorado State
- HAALAND, R. L., *Assistant Professor*, 1974. B.S., M.S., Montana State; Ph.D., New Mexico State
- ODOM, J. W., *Assistant Professor*, 1977. B.S., M.S., Tennessee; Ph.D., Purdue
- WALKER, R.H., *Assistant Professor*, 1974, 1978. B.S., M.S., Ph.D., Mississippi State
- AKRIDGE, J.R., *Superintendent, Agronomy Farm*, 1978. B.S., Auburn
- BRYANT, W. D., *Research Associate*, 1977. B.S., Auburn
- CURRIER, C. G., *Research Associate*, 1978. B.S., M.S., New Mexico State
- HARTZOG, DALLAS, *Agronomist-Peanuts (Headland)*, 1969, 1976. B.S., M.S., Auburn
- HUE, N.V., *Research Associate*, 1977. B.S., Saigon; M.S., Auburn
- JOHNSTON, W. J., *Research Associate*, 1977. B.S., Idaho; M.S., Auburn
- JOLLEY, EDDIE R., *Research Associate*, 1977. B.S., Auburn
- MCCORMICK, ROBERT F., JR., *Research Associate*, 1966. B.S., Mississippi State
- PITTS, JAMES A., *Research Associate*, 1976. B.S., Auburn
- STREET, J. E., *Research Associate*, 1978. B.S., M.S., Mississippi State
- WAGGONER, J. A., *Research Associate (Belle Mina)*, 1977. B.S., M.S., Texas A&M
- WOOD, P.A., *Research Associate*, 1978
- DOSS, B. D., *Adjunct Associate Professor (Coop. USDA)*, 1956, 1976. B.S., Auburn
- HUCK, MORRIS G., *Adjunct Associate Professor (Coop. USDA)*, 1967, 1976. B.S., M.S., Illinois; Ph.D., Michigan State
- ELKINS, C. B., *Adjunct Assistant Professor (Coop. USDA)*, 1972, 1976. B.S., M.S., Georgia
- LONG, LESLIE, *Adjunct Assistant Professor (Coop. USDA)*, 1971, 1976. B.S., M.S., Georgia; Ph.D., Florida
- KAPPELMAN, A. J., JR., *Adjunct Assistant Professor (Coop. USDA)*, 1965, 1976. B.S., Iowa State; M.S., Nebraska; Ph.D., North Carolina State
- LUND, ZANE F., *Adjunct Associate Professor (Coop. USDA)*, 1962, 1976. B.S., M.S., Auburn
- SHEPHERD, RAYMOND L., *Adjunct Assistant Professor (Coop. USDA)*, 1965, 1976. B.S., Ouachita Baptist; M.S., Arkansas; Ph.D., Auburn

ANIMAL AND DAIRY SCIENCES

- WARREN, W. M., *Professor and Head of Department*, 1955, 1957. B.S., Michigan State; M.S., Texas A&M; Ph.D., Missouri
- ANTHONY, W. B., *Professor*, 1953, 1955. B.S., Illinois; M.S., Texas A&M; Ph.D., Cornell
- CANNON, R. Y., *Professor*, 1948, 1960. B.S., Iowa State; M.S., Ohio State; Ph.D., Wisconsin
- HARRIS, RALPH R., *Professor*, 1960, 1974. B.S., M.S., Auburn; Ph.D., Texas A&M
- HAWKINS, G. E., *Professor*, 1952, 1959. B.S., Western Kentucky State; M.S., Georgia; Ph.D., North Carolina State
- HUFFMAN, DALE L., *Professor*, 1963, 1973. B.S., Cornell; M.S., Ph.D., Florida
- PARKS, PAUL F., *Professor and Dean of Graduate School*, 1956, 1974. B.S., M.S., Auburn; Ph.D., Texas A&M
- PATTERSON, TROY B., *Professor*, 1957, 1965. B.S., Mississippi State; M.S., Ph.D., Texas A&M
- SMITH, R. C., *Professor*, 1961, 1969. B.S., Elmhurst; M.S., Ph.D., Illinois College of Medicine
- STRENGTH, D. R., *Professor*, 1961, 1967. B.S., M.S., Auburn; Ph.D., Cornell
- WIGGINS, E. L., *Professor*, 1956, 1973. B.S., M.S., Oklahoma State; Ph.D., Wisconsin
- DARON, HARLOW H., *Associate Professor*, 1967, 1970. B.S., Oklahoma; Ph.D., Illinois
- KUHLERS, DARYL L., *Associate Professor*, 1978. B.S., Iowa State; M.S., Ph.D., Wisconsin
- MARPLE, D. N., *Associate Professor*, 1973, 1976. B.S., M.S., Iowa State; Ph.D., Purdue
- MCCASKEY, THOMAS A., *Associate Professor*, 1967, 1974. B.S., Ohio; M.S., Ph.D., Purdue
- ROLLINS, G. H., *Associate Professor*, 1948, 1953. B.S., M.S., Virginia Tech.; Ph.D., Illinois
- TUCKER, H. F., *Associate Professor*, 1949, 1962. B.S., M.S., Ph.D., Auburn
- PRINCE, TERRY J., *Assistant Professor*, 1976. B.S., Purdue; Ph.D., Kentucky

SCHMIDT, STEPHEN P., *Assistant Professor*, 1976. B.S., Idaho; M.S., Ph.D., Wisconsin
 THOMAS, ELVIN E., *Assistant Professor*, 1977. B.S., M.S., Ph.D., Iowa State
 WOODBURN, DON A., *Instructor*, 1978. B.S., Panhandle State; M.S., Michigan State
 CORDRAY, JOSEPH C., *Research Associate*, 1975. B.S., Iowa State; M.S., Auburn
 CUNNINGHAM, JOHN P., *Research Associate*, 1958, 1965. B.S., M.S., Auburn
 JUNGST, STEVE B., *Research Associate*, 1978. B.S., M.S., Iowa State

ANIMAL HEALTH RESEARCH

VAUGHAN, J. T., *Dean, School of Veterinary Medicine*, 1974. 1977. D.V.M., M.S., Auburn
 KING, NELSON B., *Coordinator*, 1967. B.S., D.V.M., M.S., Ph.D., Ohio State
 BECKETT, S. D., *Professor*, 1966, 1973. B.S., Mississippi State; D.V.M., M.S., Auburn; Ph.D., Missouri
 BENZ, G. W., *Professor*, 1967, 1977. B.S., D.V.M., Purdue; M.S., Ph.D., Wisconsin
 HUDSON, R. S., *Professor*, 1967, 1977. D.V.M., Oklahoma State; M.S., Auburn
 KIESEL, G. K., *Professor*, 1952, 1968. B.S., Rutgers; D.V.M., Cornell
 KRAMER, T. T., *Professor*, 1971. D.V.M., Alfort (France); M.Sc., Ph.D., Colorado State
 ROSSI, C. R., *Professor*, 1970, 1978. B.S., D.V.M., Illinois; M.S., Ohio State; Ph.D., Illinois
 SCHNURRENBERGER, P. R., *Professor*, 1972, 1976. D.V.M., Ohio State; M.P.H., Pittsburgh
 SCHULTZ, R.D., *Professor*, 1978. B.S., M.S., Ph.D., Pennsylvania State
 WALKER, D.F., *Professor*, 1958, 1966. D.V.M., Colorado State
 KRISTA, L.M., *Associate Professor*, 1969, 1973. B.S., M.S., South Dakota State; D.V.M., Ph.D., Minnesota
 SWANN, ARTHUR IAN, *Associate Professor*, 1975. D.V.M., London; M.S., Ph.D., Ohio State
 WINKLER, J. K., *Associate Professor*, 1962, 1963. D.V.M., Colorado State
 GRAY, B.W., *Assistant Professor*, 1972. D.V.M., Ph.D., Cornell
 MEADOWS, GEORGE B., *Assistant Professor*, 1951. B.S., Auburn; M.S., Florida
 BROWN, R. R., *Adjunct Instructor*, 1976. B.S., Colorado State; D.V.M., Cornell
 FRANDSEN, JOHN C., *Director, Regional Parasite Research Laboratory (Coop. USDA)*, 1961, 1973. B.S., M.S., Ph.D., Utah
 ERNST, JOHN V., *Microbiologist (Coop. USDA)*, 1968. B.S., Portland State; M.S., Ph.D., Utah
 KLESIIUS, PHILLIP H., *Immunologist (Coop. USDA)*, 1973. B.S., Florida Southern; M.S., Northwest State; Ph.D., Texas

BOTANY AND MICROBIOLOGY

LYLE, J. A., *Professor & Head of Department*, 1947, 1954. B.S., Kentucky; M.S., North Carolina State; Ph.D., Minnesota
 CURL, E. A., *Professor*, 1954, 1967. B.S., Louisiana Tech; M.S., Arkansas; Ph.D., Illinois
 DAVIS, D. E., *Professor*, 1947, 1955. B.Ed., Ph.D., Eastern Illinois; M.S., Ph.D., Ohio State
 DAVIS, NORMAN D., *Professor*, 1958, 1967. B.S., Georgia; M.S., Ph.D., Ohio State
 DIENER, URBAN L., *Professor*, 1952, 1963. B.A., Miami (Ohio); M.A., Harvard; Ph.D., North Carolina State
 GUDAUSKAS, ROBERT T., *Professor*, 1960, 1969. B.S., Eastern Illinois State; M.S., Ph.D., Illinois
 RODRIGUEZ-KABANA, RODRIGO, *Professor*, 1965, 1970. B.S., M.S., Ph.D., Louisiana State
 TRUELOVE, BRYAN, *Professor*, 1967, 1975. B.Sc. (Honors), Ph.D., Sheffield
 BACKMAN, PAUL A., *Associate Professor*, 1971, 1977. B.S., Ph.D., California (Davis)
 CLARK, E. M., *Associate Professor*, 1956, 1960. B.S., M.S., Ph.D., Minnesota
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Lower Coastal Plain—Camden, Wilcox County

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Horticulture

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HOME ECONOMICS

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Family Living

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Food and Nutrition

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Health Education

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4-H AND YOUTH

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Explanation of abbreviations listed below:

CRD—Community Resource Development

ANR—Agriculture and Natural Resources

HE—Home Economics

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COFFEE COUNTY—New Brockton

TOM C. CASADAY, *County Agent-Coordinator*, 1949, 1976. B.S., M.Ag., Auburn
 DAN J. PRESLEY, *County Agent-ANR*, 1964, 1977. B.S., M.Ag., Auburn
 SARA HUTCHINSON, *County Agent-HE*, 1956, 1976. B.S., Samford; M.S., Auburn
 SANDRA T. COFFEY, *Associate County Agent-4-H*, 1972, 1976. B.S., Tennessee
 BRENDA M. ALLEN, *Assistant County Agent-ANR*, 1978. B.S., M.S., Tuskegee

COOSA COUNTY—Rockford

GENE S. SESSIONS, *County Agent-Coordinator*, 1955, 1976. B.S., M.Ag.Ed., Auburn
 MARIAH BRYMER, *County Agent-HE*, 1963, 1976. B.S., M.Ed., Tuskegee

MELINDA J. LANGFORD, *Assistant County Agent-4-H*, 1978. B.S., M.S., Auburn
 JIMMY D. SMITHERMAN, *Assistant County Agent-4-H*, 1978. B.S., Auburn

COVINGTON COUNTY—Andalusia

CLAUDE W. PIKE, *County Agent-Coordinator*, 1952, 1978. B.S., M.Ag., Auburn
 DONALD LESTER, *Associate County Agent-4-H*, 1973, 1976. B.S., Auburn
 ROBERT E. LINDER, *County Agent-ANR*, 1960, 1977. B.S., M.Ag., Auburn
 MARY ELLEN HAYNES, *County Agent-HE*, 1951, 1976. B.S., Montevallo
 ANN T. MARTIN, *County Agent-4-H*, 1966, 1976. B.S., Alabama

CRENSHAW COUNTY—Luverne

TED B. SMITH, *County Agent-Coordinator*, 1963, 1976. B.S., M.S., Troy State
 GLENN B. HANDLEY, *County Agent-4-H*, 1948, 1976. B.S., Auburn
 BOBBY G. SPEARS, *Assistant County Agent-ANR*, 1977. B.S., Auburn
 HELEN J. BROWN, *Assistant County Agent-4-H*, 1977. B.S., Alabama A&M; M.S., Tennessee State
 EUNICE P. KING, *County Agent-HE*, 1953. B.S., Montevallo

DALE COUNTY—Ozark

JAMES H. ESTES, *County Agent-Coordinator*, 1963, 1977. B.S., M.Ag., Auburn
 IDA JO HARRISON, *County Agent-HE*, 1970, 1976. B.S., Montevallo; M.Ed., Tennessee
 PATSY M. WHITE, *Associate County Agent-4-H*, 1970, 1977. B.S., M.S., Troy State
 ROBERT R. KENNEDY, *Assistant County Agent-ANR*, 1978. B.S., Clemson

ELMORE COUNTY—Wetumpka

JACK A. THOMPSON, *County Agent-Coordinator*, 1959, 1976. B.S., M.S., Tennessee
 G. W. JACKSON, *Associate County Agent-ANR*, 1966, 1976. B.S., M.S., Tuskegee
 MARILEE TANKERSLEY, *Associate County Agent-HE*, 1975, 1977. B.S., Auburn
 GWENDOLYN TURNER, *Associate County Agent-4-H*, 1968, 1976. B.S., Alabama A&M
 MARK P. ELLIOTT, *Assistant County Agent-4-H*, 1978. B.S., Auburn

GENEVA COUNTY—Geneva

ROBERT C. REYNOLDS, *County Agent-Coordinator*, 1954, 1976. B.S., M.Ag.Ed., Auburn
 EMILY H. SEAY, *County Agent-HE*, 1960, 1976. B.S., Montevallo
 WANDA C. WHITE, *Assistant County Agent-4-H*, 1973, 1976. B.S., Auburn

HENRY COUNTY—Abbeville

MARGARET KIRKLAND, *County Agent-Coordinator*, 1961, 1976. B.S., M.H.Ed., Jacksonville State
 RASSIE T. FARMER, *Associate County Agent-HE*, 1967, 1976. B.S., Langston
 JEWEL W. HARDWICK, *Assistant County Agent-4-H*, 1958, 1976. B.S., Auburn
 RICHARD W. MURPHY, *Assistant County Agent-4-H*, 1978. B.S., Auburn

HOUSTON COUNTY—Dothan

ALLEN M. MATHEWS, *County Agent-Coordinator*, 1957, 1976. B.S., M.Ag., Auburn
 MICHAEL A. DAVIS, *Associate County Agent-ANR*, 1970, 1977. B.S., M.S., Auburn
 REAFIELD VESTER, *Associate County Agent-ANR*, 1966, 1976. B.S., Alabama A&M; M.S., Florida
 JULIA SMITH, *County Agent-HE*, 1955, 1976. B.S., Auburn
 CLAUDIA MEADOWS, *Assistant County Agent-4-H*, 1971, 1976. B.S., Auburn
 MILDRED WARD, *County Agent-HE*, 1955, 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 WILLIAM F. BASSETT, *Assistant County Agent-4-H*, 1978. B.S., Florida
 L. CHARLES CHAPMAN, *Assistant County Agent-ANR*, 1978. B.S., Auburn

LEE COUNTY—Opelika

JEFFREY CLARY, *Associate County Agent-Coordinator*, 1973, 1977. B.S., Auburn
 SUSAN B. WETHERINGTON, *Assistant County Agent-HE*, 1970, 1976. B.S., Georgia

DAVID E. DERRICK, *Assistant County Agent-4-H*, 1976. B.S., Auburn
 LAWRENCE C. GRAHAM, *Assistant County Agent-ANR*, 1977. B.S., Auburn
 CAROL A. WALTHALL, *Assistant County Agent-4-H*, 1978. B.S., Auburn

MACON COUNTY—Tuskegee

ELMER DOWDELL, *County Agent-Coordinator*, 1957. 1977. B.S., Aicorm A&M; M.S., Tuskegee
 JAMES E. BOYD, *Associate County Agent-4-H*, 1971. 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 LEONARD HUFFMAN, *County Agent-ANR*, 1962. 1976. B.S., M.Ed., Tuskegee
 CAROLYN B. WILLIAMS, *County Agent-HE*, 1962. 1976. B.S., Tuskegee
 ANNETTE B. WALLACE, *Associate County Agent-4-H*, 1966. 1977. B.S., M.S., Alabama A&M

MONTGOMERY COUNTY—Montgomery

ADDRE BRYANT, *County Agent-Coordinator*, 1954. 1977. B.S., M.S., Tuskegee
 DAVID L. DANIEL, *Assistant County Agent-4-H*, 1972. 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 BOBBY L. HANKS, *Associate County Agent-ANR*, 1974. 1976. B.S., Auburn
 BOBBY L. JONES, *Associate County Agent-ANR*, 1973. 1976. B.S., Auburn
 VIRGINIA S. GILCHRIST, *County Agent-HE*, 1955. 1976. B.S., M.S., Alabama
 MARIE M. CRENSHAW, *Assistant County Agent-4-H*, 1967. 1976. B.S., Tuskegee
 SHELBY B. ELLIS, *Assistant County Agent-4-H*, 1972. 1976. B.S., Tuskegee
 IMOGENE RITENBURGH, *Assistant County Agent-HE*, 1973. 1976. B.S., Southern Mississippi
 GEORGE STRITIKUS, *Assistant County Agent-ANR (HORT)*, 1978. B.S., M.S., Auburn

PIKE COUNTY—Troy

J. A. McLEAN, *County Agent-Coordinator*, 1954. 1976. B.S., M.Ag.Ed., Auburn
 DAVID B. CARPENTER, *Assistant County Agent-ANR*, 1975. 1976. B.S., Auburn
 FLORENCE OWENS, *County Agent-HE*, 1958. 1976. B.S., Florida State
 DENA L. BARNES, *Assistant County Agent-4-H*, 1973. 1976. B.S., Auburn
 BARRY L. COOK, *Assistant County Agent-4-H*, 1977. B.S., Tuskegee

RANDOLPH COUNTY—Wedowee

GRADY M. WAKEFIELD, *County Agent-Coordinator*, 1957. 1976. B.S., M.Ed., Auburn
 TOM F. BURNSIDE, JR., *County Agent-4-H*, 1960. 1976. B.S., M.Ed., Auburn
 ELAINE E. NELSON, *Associate County Agent-HE*, 1969. 1976. B.S., Jacksonville State
 CAROLYN C. BARNETT, *Assistant County Agent-4-H*, 1978. B.S., N. Alabama

RUSSELL COUNTY—Phenix City

LARRY D. EASTERWOOD, *County Agent-Coordinator*, 1961. 1977. B.S., Auburn
 DONALD BICE, *Assistant County Agent-ANR*, 1970. 1977. B.S., Auburn
 BETTY H. WILSON, *Associate County Agent-HE*, 1971. 1976. B.S., Montevallo
 ISAAC BIAS, *Assistant County Agent-4-H*, 1973. 1976. B.S., Fort Valley; M.S., Tuskegee
 ANGELA G. HUGHES, *Assistant County Agent-4-H*, 1973. 1976. B.S., Samford

TALLADEGA COUNTY—Talladega

MARIE H. PLAYER, *County Agent-Coordinator*, 1957. 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 JAKE B. MATHEWS, *County Agent-ANR*, 1949. 1977. B.S., Auburn
 WANDA P. JURRIANS, *County Agent-HE*, 1965. 1976. B.S., Jacksonville State; M.A., Auburn
 JOHN M. HARRIS, *Assistant County Agent-ANR*, 1978. B.S., Auburn
 MALLORY SKIPPY REEVES, *Assistant County Agent-4-H*, 1978. B.S., Georgia

TALLAPOOSA COUNTY—Dadeville

C. HOYT WEBB, *County Agent-Coordinator*, 1946. 1976. B.S., Auburn
 JERRY G. HANKS, *Associate County Agent-4-H*, 1970. 1976. B.S., Auburn
 JAMES L. McGHEE, *Associate County Agent-ANR*, 1968. 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 R. WAYNE THOMPSON, *County Agent-ANR*, 1958. 1976. B.S., M.Ag. Ed., Auburn
 MARGARET MILLER, *County Agent-HE*, 1949. 1976. B.S., Auburn
 NELDA B. MARTIN, *Associate County Agent-4-H*, 1971. 1976. B.S., Alabama

DISTRICT III (Selma)

SUPERVISORY STAFF

ROBERT C. FARQUHAR, *District Agent-Coordinator*, 1949, 1979. B.S., M.S., Auburn
 L. SHELTON HAWSEY, *District Agent-4-H*, 1965, 1976. B.S., M.Ed., Auburn
 ROBERT F. JONES, *District Agent-Special Programs*, 1949, 1976. B.S., Tuskegee; M.Ed., N. Carolina State
 CHARLES H. SEGREST, *District Agent-CRD*, 1956, 1976. B.S., M.Ag.Ed., Auburn
 W. GAINES SMITH, *District Agent-ANR*, 1965, 1976. B.S., M.Ag., Auburn
 SARAH N. WATSON, *District Agent-Home Economics*, 1961, 1977. B.S., M.S., Alabama

COUNTY STAFF

AUTAUGA COUNTY—Prattville

WAYNE E. DAVIS, *County Agent-Coordinator*, 1959, 1978. B.S., M.S., Auburn
 JOHN A. GIDDENS, III, *Assistant County Agent-4-H*, 1978. B.S., Auburn
 JAMES M. CONLEY, *Assistant County Agent-ANR (Pest Mgt.)*, 1976. B.S., Tennessee at Martin
 JERRY A. GREEN, *County Agent-SP*, 1954, 1976. B.S., Tuskegee
 JUDITH F. BROWN, *Associate County Agent-HE*, 1970, 1977
 SUSAN ANN GASTON, *Assistant County Agent-4-H*, 1975, 1977. B.S., Montevallo

BALDWIN COUNTY—Bay Minette

RALPH C. THOMPSON, *County Agent-Coordinator*, 1954, 1976. B.S., Auburn; M.S., Montevallo
 DONALD EUGENE DUNN, *Associate County Agent-ANR*, 1962, 1977. B.S., Auburn
 LYNDLE EDWARD TUNNELL, *Associate County Agent-4-H*, 1973, 1976. B.S., M.Ed., Auburn
 EUGENIA R. SMALL, *County Agent-HE*, 1973, 1976. B.S., Auburn
 GRACE KIRKMAN, *Assistant County Agent-HE*, 1975, 1976. B.S., Alabama
 DALE B. DAWKINS, *Associate County Agent-4-H*, 1967, 1978. B.S., Alabama; M.S., Livingston

BIBB COUNTY—Centreville

LLOYD P. OWENS, *County Agent-Coordinator*, 1954, 1976. B.S., M.Ag., Auburn
 THARON W. CAMP, *County Agent-4-H*, 1951, 1976. B.S., Auburn
 FAYE B. SMITH, *Associate County Agent-HE*, 1964, 1976. B.S., Alabama
 MATTIE M. WALKER, *Assistant County Agent-4-H*, 1974, 1976. B.S., Alabama A&M

BUTLER COUNTY—Greenville

JACOB H. ROSS, *County Agent-Coordinator*, 1950, 1977. B.S., Tuskegee; M.A., Michigan State
 J. PAUL MOORE, *County Agent-ANR*, 1953, 1976. B.S., M.Ag., Auburn
 LAURINE HOWELL, *County Agent-HE*, 1949, 1976. B.S., Alabama
 WILMA JEAN WOMACK, *Associate County Agent-4-H*, 1973, 1977. B.S., Alabama A&M
 MARK D., COLBERT, *Assistant County Agent-ANR*, 1978. B.S., M.S., Florida

CHILTON COUNTY—Clanton

JAMES CASH HOWELL, *County Agent-Coordinator*, 1961, 1977. B.S., M.Ag.Ed., Auburn
 TOMMY J. BROWN, *Associate County Agent-ANR*, 1971, 1977. B.S., Auburn
 DANIEL R. MIMS, *County Agent-4-H*, 1953, 1976. B.S., Auburn
 JOHNNIE M. LANE, *County Agent-HE*, 1952, 1976. A.B., Judson
 SARAH HICKMAN McDOWELL, *Associate County Agent-4-H*, 1967, 1977. B.S., Montevallo

CHOCTAW COUNTY—Butler

R. B. DEAVOURS, *County Agent—Coordinator*, 1946, 1977. B.S., Auburn; M.S., Mississippi State
 GRACE M. PRINCE, *County Agent—HE*, 1951, 1976. B.S., Auburn
 GLADYS L. HORN, *County Agent—4-H*, 1950, 1976. B.S., Tuskegee
 LAURICE M. PRINCE, *Assistant County Agent—4-H*, 1977. B.S., Auburn

CLARKE COUNTY—Grove Hill

FRED W. KILGORE, *County Agent—Coordinator*, 1954, 1976. B.S., Auburn; M.S., Mississippi State
 THOMAS J. BRELAND, *Associate County Agent—4-H*, 1972, 1977. B.S., M.Ed., Tuskegee
 SARA G. ALEXANDER, *County Agent—HE*, 1967, 1976. B.S., Mississippi State for Women
 JOE ANN ARTHUR, *Associate County Agent—4-H*, 1967, 1977. B.S., Southern Mississippi
 GERARD J. BOOS, JR., *Assistant County Agent—ANR*, 1977. B.S., Louisiana State; M.S., Tennessee

CONECUH COUNTY—Evergreen

LOUISE T. OSTROM, *County Agent—Coordinator*, 1957, 1978. B.S., M.Ed., Auburn
 HERBERT J. OAKLEY, *County Agent—ANR*, 1954, 1976. B.S., Auburn
 STEPHEN M. HARRIS, *Associate County Agent—4-H*, 1944, 1976. B.S., Tuskegee; M.Ed., Alabama State
 HAZEL H. HARPE, *Associate County Agent—4-H*, 1961, 1977. B.A., Judson
 THAGARD R. COLVIN, *Assistant County Agent—4-H*, 1978. B.S., Auburn

DALLAS COUNTY—Selma

CHARLES D. SCOTT II, *County Agent—Coordinator*, 1951, 1976. B.S., M.Ed., Tuskegee
 NORMA M. McCRORY, *County Agent—HE*, 1961, 1976. B.S., Southern Mississippi
 HARRIET R. BATES, *Assistant County Agent—4-H*, 1974, 1976. B.S., M.Ed., Alabama State
 DARRELL BISHOP, *Assistant County Agent—4-H*, 1977. B.S., Auburn
 SAM D. CARROLL, *Associate County Agent—ANR*, 1978. B.S., M.S., Auburn
 THOMAS R. THOMPSON, *Assistant County Agent—ANR*, 1978. B.S., Arizona; M.S., Florida

ESCAMBIA COUNTY—Brewton

R. JEFF MARTIN, *County Agent—Coordinator*, 1946, 1976. B.S., Auburn
 EDWARD M. KNOWLES, *County Agent—ANR*, 1953, 1976. B.S., M.Ag., Auburn
 BARRY E. WOOD, *Associate County Agent—4-H*, 1966, 1977. B.S., Auburn
 PEGGY G. BRACKEN, *County Agent—HE*, 1963, 1976. B.S., Auburn
 CAROLYN F. BIVINS, *Assistant County Agent—4-H*, 1974, 1976. B.S., Tuskegee

GREENE COUNTY—Eutaw

JERRY B. CLARK, *County Agent—Coordinator*, 1965, 1977. B.S., M.Ed., Auburn
 EVELYN BLACKMON, *Associate County Agent—HE*, 1965, 1976. B.S., Alabama A&M
 BETTY SUE YOUNG, *Associate County Agent—4-H*, 1972, 1976. B.S., M.S., Tuskegee

HALE COUNTY—Greensboro

JACK N. GLASS, *County Agent—Coordinator*, 1937, 1977. B.S., M.Ag., Auburn
 GWINN RUSSELL EZELL, *County Agent—4-H*, 1962, 1976. B.S., Alabama A&M
 EVELYN D. EDWARDS, *County Agent—HE*, 1966, 1976. B.S., M.S., Alabama
 KATIE I. CARLTON, *County Agent—4-H*, 1950, 1976. B.S., Tuskegee
 MARIE P. DOMBHART, *Associate County Agent—4-H*, 1959, 1976. B.S., Auburn

LOWNDES COUNTY—Hayneville

TOM J. GERALD, *County Agent—Coordinator*, 1946, 1976. B.S., M.Ag., Auburn
 SCOTT BILLINGSLEY, *County Agent—ANR*, 1951, 1976. B.S., M.S., Tuskegee
 CLARENCE J. MAULDIN, *Assistant County Agent—4-H*, 1972, 1976. B.S., M.S., Tuskegee
 CAROLYN L. HICKS, *Associate County Agent—HE*, 1967, 1976. B.S., Tuskegee
 KATIE WELCH JACKSON, *Assistant County Agent—4-H*, 1973, 1976. B.S., Alabama

MARENGO COUNTY—Linden

CECIL MILLER, *County Agent-Coordinator*, 1954, 1976. B.S., M.Ag., Auburn
 WILLIAM M. NORWOOD, *Associate County Agent-4-H*, 1973, 1977. B.S., Alabama A&M; M.Ed., Tuskegee
 MARJORIE W. WEAVER, *County Agent-HE*, 1943, 1976. B.S., Auburn
 ROSALYN KETCHUM PALMER, *County Agent-4-H*, 1960, 1976. B.S., Auburn
 VERA J. WILSON, *Associate County Agent-4-H*, 1966, 1976. B.S., Alabama A&M
 CHARLES E. SMITH, *County Agent-ANR*, 1966, 1978. B.S., M.Ed., Auburn

MOBILE COUNTY—Mobile

ANDREW D. GREER, *Assistant County Agent-Urban 4-H*, 1973, 1976. B.S., Auburn
 DENNIS PETERSON, *Assistant County Agent-4-H*, 1973, 1976. B.S., Auburn
 MYRA N. BARTON, *Associate County Agent-HE*, 1968, 1977. B.S., Montevallo; M.S., S. Alabama
 RANDALL DRINKARD, *Assistant County Agent-ANR*, 1977. B.S., M.S., Georgia
 SYLVIA G. OAKES, *Assistant County Agent-HE*, 1972, 1976. B.S., Alabama A&M
 JULIA McCOLLUM, *Assistant County Agent-Urban 4-H*, 1975, 1976. B.S., North Carolina A&T
 RICHARD A. WRIGHT, *Assistant County Agent-ANR*, 1977. B.S., Auburn
 MARJORIE J. SELLERS, *Assistant County Agent-4-H*, 1972, 1978. B.S., Auburn

MONROE COUNTY—Monroeville

MAX F. SCOTT, *County Agent-Coordinator*, 1962, 1977. B.S., M.Ag., Auburn
 MIKE M. GAMBLE, *Associate County Agent-ANR*, 1966, 1977. B.S., Mississippi State
 RODIE M. RUFFIN, *Assistant County Agent-4-H*, 1973, 1976. B.S., Tuskegee
 ANNIE C. RICHARDSON, *County Agent-HE*, 1952, 1976. A.B., Judson; M.S., Livingston
 DELOIS CARMICHAEL, *County Agent-HE*, 1952, 1976. B.S., M.Ed., Tuskegee
 MARILYN MARIE MOODY, *Assistant County Agent-4-H*, 1977. B.S., Auburn

PERRY COUNTY—Marion

JOE E. LASHLEY, *County Agent-Coordinator*, 1961, 1977. B.S., M.Ag., Auburn
 J. A. BATES, JR., *County Agent-ANR*, 1950, 1976. B.S., Auburn
 RICHARD E. SMITH, *County Agent-4-H*, 1962, 1976. B.S., Alabama A&M; M.Ed., Tuskegee
 EVELYN GRAHAM, *County Agent-HE*, 1950, 1976. B.S., Alabama
 JOYCE N. RICHARDSON, *Associate County Agent-4-H*, 1958, 1976. B.S., Judson

PICKENS COUNTY—Carrollton

EDWARD N. GRAHAM, *County Agent-Coordinator*, 1960, 1976. B.S., M.S., Mississippi State
 WALTER D. POWERS, *County Agent-ANR*, 1966, 1976. B.S., Mississippi State
 THEODIS HENDERSON, *Assistant County Agent-4-H*, 1975, 1976. B.S., Alabama A&M
 HELEN B. HILL, *County Agent-HE*, 1941, 1976. B.S., Montevallo; M.S., Alabama
 LORRAINE K. MEEKS, *County Agent-4-H*, 1957, 1977. B.S., Alabama

SUMTER COUNTY—Livingston

B. B. WILLIAMSON, *County Agent-Coordinator*, 1946, 1976. B.S., M.Ag., Auburn
 MILDRED M. ENNIS, *County Agent-HE*, 1958, 1976. B.S., Tennessee; M.S., Livingston
 GLORIA R. STEINHILBER, *Assistant County Agent-4-H*, 1970, 1976. B.S., Montevallo
 THERESA E. THREADGILL, *County Agent-4-H*, 1957, 1976. B.S., Tuskegee
 JEFFREY L. McCLOURE, *Assistant County Agent-ANR*, 1978. B.S., Auburn

TUSCALOOSA COUNTY—Tuscaloosa

ALBERT PITTS, JR., *County Agent-Coordinator*, 1952, 1976. B.S., M.Ag., Auburn
 B. B. FIELDS, *County Agent-4-H*, 1954, 1976. B.S., Tuskegee; M.S., Illinois
 FRENCH SCONYERS, *County Agent-ANR*, 1943, 1976. B.S., Auburn
 ELIZABETH STEWART, *County Agent-HE*, 1945, 1976. B.S., M.S., Alabama
 O'NEAL MASSEY, *County Agent-HE*, 1952, 1976. B.S., M.S., Alabama
 JO ANN H. SMITH, *Associate County Agent-4-H*, 1970, 1977. B.S., M.S., Alabama
 PEGGY L. WHITE, *Associate County Agent-4-H*, 1971, 1976. B.S., M.S., Alabama
 JAMEY M. CLARY, *Assistant County Agent-4-H*, 1974, 1978. B.S., Auburn

WASHINGTON COUNTY—Chatom

D. O. ESTES, *County Agent-Coordinator*, 1949, 1976. B.S., Auburn

THOMAS E. FULLER, *Associate County Agent-ANR*, 1969, 1977. B.S., Auburn

SARAH H. HAZEN, *Associate County Agent-HE*, 1964, 1976. B.S., Auburn

PATRICIA ANN TAYLOR, *Assistant County Agent-4-H*, 1968, 1976. B.S., Alabama

WILCOX COUNTY—Camden

RICHARD E. COBB, SR., *Associate County Agent-4-H*, 1950, 1977. B.S., Tuskegee

WILLIAM J. HARDY, *County Agent-4-H*, 1954, 1976. B.S., Auburn

SOLOMONIA E. REYNOLDS, *County Agent-HE*, 1949, 1976. B.S., Alabama A&M; M.Ed., Tuskegee

BETTY JEAN BUSH, *Assistant County Agent-4-H*, 1977. B.S., Montevallo

ENGINEERING EXPERIMENT STATION STAFF

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J. GRADY COX, B.S., M.S., Ph.D. *Director*
CLEMENTS B. MERRITT, B.M.E., M.S., *Assistant Director*

Engineering—Research Services

WILLIAM G. SHERLING, JR., B.A.E., M.S., *Director*
FOWLER DUGGER, JR., B.A., M.A., *Assistant Director, Public Research*
JOHN E. BIRKETT, B.S.A.E., *Field Representative*
DONALD L. HOSKINS, B.S., *Field Representative*

Dual roles are performed by faculty and staff of the School of Engineering who serve also as personnel of the Engineering Experiment Station.

ENGINEERING EXTENSION SERVICE STAFF

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J. GRADY COX, B.S., M.S., Ph.D., *Director*
JAMES F. O'BRIEN, JR. B.M.E., M.M.E., *Associate Director*
OLAN A. HEMBREE, *Assistant To Director*
ANNE P. JEFFRIES, *Assistant For*
New Program Development, Birmingham Office
JAMES R. WILBANKS, B.M.E., M.M.E., *Director, Auburn Office*
A. HENRY AVERYT, B.M.E., M.S.I.M., *Director, Birmingham Office*
New Program Development, Birmingham Office
LUELLEN NAGLE, B.S.Ed., *Administrative Assistant, Birmingham Office*

Dual roles are performed by faculty and staff of the School of Engineering who serve also as personnel of the Engineering Extension Service.

ENROLLMENT STATISTICS

Table 1—Enrollment by Classes, Courses, and Divisions
Fall Quarter, 1978

SCHOOL AND CURRICULUM

School of Agriculture

	Freshmen	Sophomores	Juniors	Seniors	5th Year	Special and Unclassified	Totals by Sex
	M	M	M	M	M	M	M
	W	W	W	W	W	W	W
	Total	Total	Total	Total	Total	Total	Total
Animal and Dairy Science (ADS)	17	34	37	36	0	4	128
Agriculture Business and Economics (AEC)	13	13	25	29	0	1	81
Agricultural Science (AGS)	19	11	12	10	0	2	44
Agricultural Engineering (AN)	11	5	17	15	0	0	48
Agroonomy and Soils (AY)	7	18	26	31	0	1	84
Biological Science (BI)	1	0	0	2	0	0	2
Botany (BY)	1	1	2	4	0	2	10
Entomology (ENT)	0	2	3	4	0	0	9
Flowers Management (FAA)	7	4	13	15	0	6	45
Food Science (FS)	0	1	1	6	0	0	8
Forest Management (FY)	47	59	84	91	0	2	283
Horticulture (H)	3	4	4	4	0	0	15
Microbiology (MB)	1	3	5	7	0	1	21
Marine Biology (MRB)	14	16	11	23	0	0	50
Landscape and Ornamental Horticulture (OH)	12	13	23	16	0	1	65
Poultry Science (PH)	0	0	0	15	0	0	15
Wildlife Management (WL)	11	6	4	16	0	0	37
Wood Technology (WT)	0	0	3	2	0	0	5
Zoology (ZY)	8	6	10	17	0	3	44
TOTAL Undergraduate	182	299	292	335	0	24	1,022
GRADUATE SCHOOL TOTAL (Agriculture)							71
							279
							1,301
							391

School of Architecture and
Fine Arts

Program	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2033-2034	2034-2035	2035-2036	2036-2037	2037-2038	2038-2039	2039-2040	2040-2041	2041-2042	2042-2043	2043-2044	2044-2045	2045-2046	2046-2047	2047-2048	2048-2049	2049-2050	2050-2051	2051-2052	2052-2053	2053-2054	2054-2055	2055-2056	2056-2057	2057-2058	2058-2059	2059-2060	2060-2061	2061-2062	2062-2063	2063-2064	2064-2065	2065-2066	2066-2067	2067-2068	2068-2069	2069-2070	2070-2071	2071-2072	2072-2073	2073-2074	2074-2075	2075-2076	2076-2077	2077-2078	2078-2079	2079-2080	2080-2081	2081-2082	2082-2083	2083-2084	2084-2085	2085-2086	2086-2087	2087-2088	2088-2089	2089-2090	2090-2091	2091-2092	2092-2093	2093-2094	2094-2095	2095-2096	2096-2097	2097-2098	2098-2099	2099-2100	2100-2101	2101-2102	2102-2103	2103-2104	2104-2105	2105-2106	2106-2107	2107-2108	2108-2109	2109-2110	2110-2111	2111-2112	2112-2113	2113-2114	2114-2115	2115-2116	2116-2117	2117-2118	2118-2119	2119-2120	2120-2121	2121-2122	2122-2123	2123-2124	2124-2125	2125-2126	2126-2127	2127-2128	2128-2129	2129-2130	2130-2131	2131-2132	2132-2133	2133-2134	2134-2135	2135-2136	2136-2137	2137-2138	2138-2139	2139-2140	2140-2141	2141-2142	2142-2143	2143-2144	2144-2145	2145-2146	2146-2147	2147-2148	2148-2149	2149-2150	2150-2151	2151-2152	2152-2153	2153-2154	2154-2155	2155-2156	2156-2157	2157-2158	2158-2159	2159-2160	2160-2161	2161-2162	2162-2163	2163-2164	2164-2165	2165-2166	2166-2167	2167-2168	2168-2169	2169-2170	2170-2171	2171-2172	2172-2173	2173-2174	2174-2175	2175-2176	2176-2177	2177-2178	2178-2179	2179-2180	2180-2181	2181-2182	2182-2183	2183-2184	2184-2185	2185-2186	2186-2187	2187-2188	2188-2189	2189-2190	2190-2191	2191-2192	2192-2193	2193-2194	2194-2195	2195-2196	2196-2197	2197-2198	2198-2199	2199-2200	2200-2201	2201-2202	2202-2203	2203-2204	2204-2205	2205-2206	2206-2207	2207-2208	2208-2209	2209-2210	2210-2211	2211-2212	2212-2213	2213-2214	2214-2215	2215-2216	2216-2217	2217-2218	2218-2219	2219-2220	2220-2221	2221-2222	2222-2223	2223-2224	2224-2225	2225-2226	2226-2227	2227-2228	2228-2229	2229-2230	2230-2231	2231-2232	2232-2233	2233-2234	2234-2235	2235-2236	2236-2237	2237-2238	2238-2239	2239-2240	2240-2241	2241-2242	2242-2243	2243-2244	2244-2245	2245-2246	2246-2247	2247-2248	2248-2249	2249-2250	2250-2251	2251-2252	2252-2253	2253-2254	2254-2255	2255-2256	2256-2257	2257-2258	2258-2259	2259-2260	2260-2261	2261-2262	2262-2263	2263-2264	2264-2265	2265-2266	2266-2267	2267-2268	2268-2269	2269-2270	2270-2271	2271-2272</
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TABLE II—ENROLLMENT OF ALABAMA STUDENTS BY
COUNTIES

FALL QUARTER, 1978

County	Men	Women	Total
Autauga	67	45	112
Baldwin	142	87	229
Barbour	55	33	88
Bibb	5	7	12
Blount	27	13	40
Bullock	32	16	48
Butler	30	22	52
Calhoun	158	80	238
Chambers	169	158	327
Cherokee	26	11	37
Chilton	36	18	54
Choctaw	11	6	17
Clarke	28	11	39
Clay	24	21	45
Cleburne	6	3	9
Coffee	91	78	169
Colbert	83	23	106
Conecuh	14	7	21
Coosa	23	13	36
Covington	85	64	149
Crenshaw	31	19	50
Cullman	65	38	103
Dale	91	55	146
Dallas	72	54	126
DeKalb	73	40	113
Elmore	97	77	174
Escambia	80	60	140
Etowah	135	99	234
Fayette	18	6	24
Franklin	23	11	34
Geneva	42	34	76
Greene	16	20	36
Hale	16	12	28
Henry	35	20	55
Houston	153	132	285
Jackson	73	34	107
Jefferson	1,189	836	2,025
Lamar	12	6	18
Lauderdale	134	68	202
Lawrence	18	7	25
Lee	809	773	1,582
Limestone	64	26	90
Lowndes	22	16	38
Macon	50	69	119
Madison	560	407	967
Marengo	36	31	67
Marion	30	17	47
Marshall	97	71	168
Mobile	314	234	548
Monroe	55	34	89
Montgomery	548	470	1,018
Morgan	177	132	309
Perry	15	8	23
Pickens	11	5	16
Pike	42	27	69
Randolph	55	52	107
Russell	138	120	258
St. Clair	30	13	43
Shelby	55	24	79
Sumter	10	9	19
Talladega	157	83	240
Tallapoosa	118	120	238
Tuscaloosa	50	29	79
Walker	28	14	42
Washington	9	10	19
Wilcox	15	9	24
Winston	11	1	12
TOTAL (Alabama)	6,991	5,148	12,139

TABLE III—ENROLLMENT OF STUDENTS BY STATES
AND TERRITORIES
FALL QUARTER, 1978

State	Men	Women	Total
Alaska	2	0	2
Arizona	6	3	9
Arkansas	19	10	29
California	55	15	70
Colorado	6	2	8
Connecticut	18	9	27
Delaware	7	7	14
District of Columbia	2	0	2
Florida	921	745	1,666
Georgia	954	838	1,792
Hawaii	1	1	2
Illinois	52	19	71
Indiana	16	8	24
Iowa	7	1	8
Kansas	2	4	6
Kentucky	109	54	163
Louisiana	51	31	82
Maine	5	3	8
Maryland	65	21	86
Massachusetts	15	7	22
Michigan	14	12	26
Minnesota	2	3	5
Mississippi	89	47	136
Missouri	10	6	16
Montana	0	1	1
Nebraska	1	2	3
Nevada	3	2	5
New Hampshire	2	0	2
New Jersey	62	25	87
New Mexico	7	2	9
New York	88	28	116
North Carolina	111	62	173
North Dakota	1	1	2
Ohio	62	20	82
Oklahoma	8	6	14
Oregon	3	1	4
Pennsylvania	47	28	75
Rhode Island	5	2	7
South Carolina	59	48	107
South Dakota	4	1	5
Tennessee	268	159	427
Texas	47	21	68
Utah	4	1	5
Virginia	112	67	179
Washington	8	3	11
West Virginia	13	7	20
Wisconsin	11	4	15
Wyoming	2	0	2
TOTAL—Other States	3,356	2,337	5,693
TOTAL—All States	10,347	7,485	17,832
United States Territories			
Canal Zone	2	1	3
Puerto Rico	1	0	1
TOTAL—U. S. Territories	3	1	4

TABLE IV—ENROLLMENT OF STUDENTS BY FOREIGN
COUNTRY
FALL QUARTER, 1978

Foreign Country	Men	Women	Total
Australia	1	0	1
Bahamas	2	1	3
Bangladesh	4	0	4
Belgium	1	0	1
Bolivia	2	0	2
Canada	1	1	2
China (Taiwan)	72	30	102
Columbia	10	1	11
Egypt	2	3	5
France	0	1	1
Germany	0	2	2
Greece	2	0	2
Guatemala	3	1	4
Guyana	1	0	1
Dominican Republic	1	0	1
Honduras	2	1	3
Hong Kong	4	0	4
India	21	3	24
Indonesia	12	0	2
Iran	12	2	14
Iraq	1	0	1
Ireland	0	1	1
Israel	1	0	1
Jamaica, W. I.	4	3	7
Jordan	2	0	2
Kuwait	2	1	3
Lebanon	0	1	1
Malaysia	6	0	6
Mexico	3	0	3
Nepal	3	0	3
Netherlands	1	0	1
Nigeria	6	0	6
Pakistan	4	1	5
Peru	1	0	1
Philippine Islands	3	1	4
Republic of Vietnam	1	1	2
Singapore	1	1	2
South Africa	1	0	1
Sudan	3	0	3
Tanzania	1	0	1
Thailand	6	6	12
Turkey	0	1	1
United Kingdom	6	2	8
Venezuela	3	1	4
Virgin Islands	1	0	1
TOTAL—Foreign Countries	203	66	269
TOTAL STUDENTS ENROLLED			
Fall Quarter, 1978	10,553	7,552	18,105

General Summary of Enrollment

Total Enrollment on Auburn Campus (Credit)	18,105
Auburn Campus Non-Credit Community Service Programs	3,113
Correspondence Study	153
GRAND TOTAL	21,371

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